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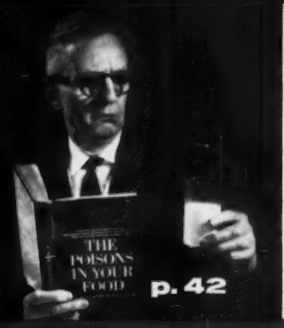

APRIL 1960

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FOOD ENGINEERING

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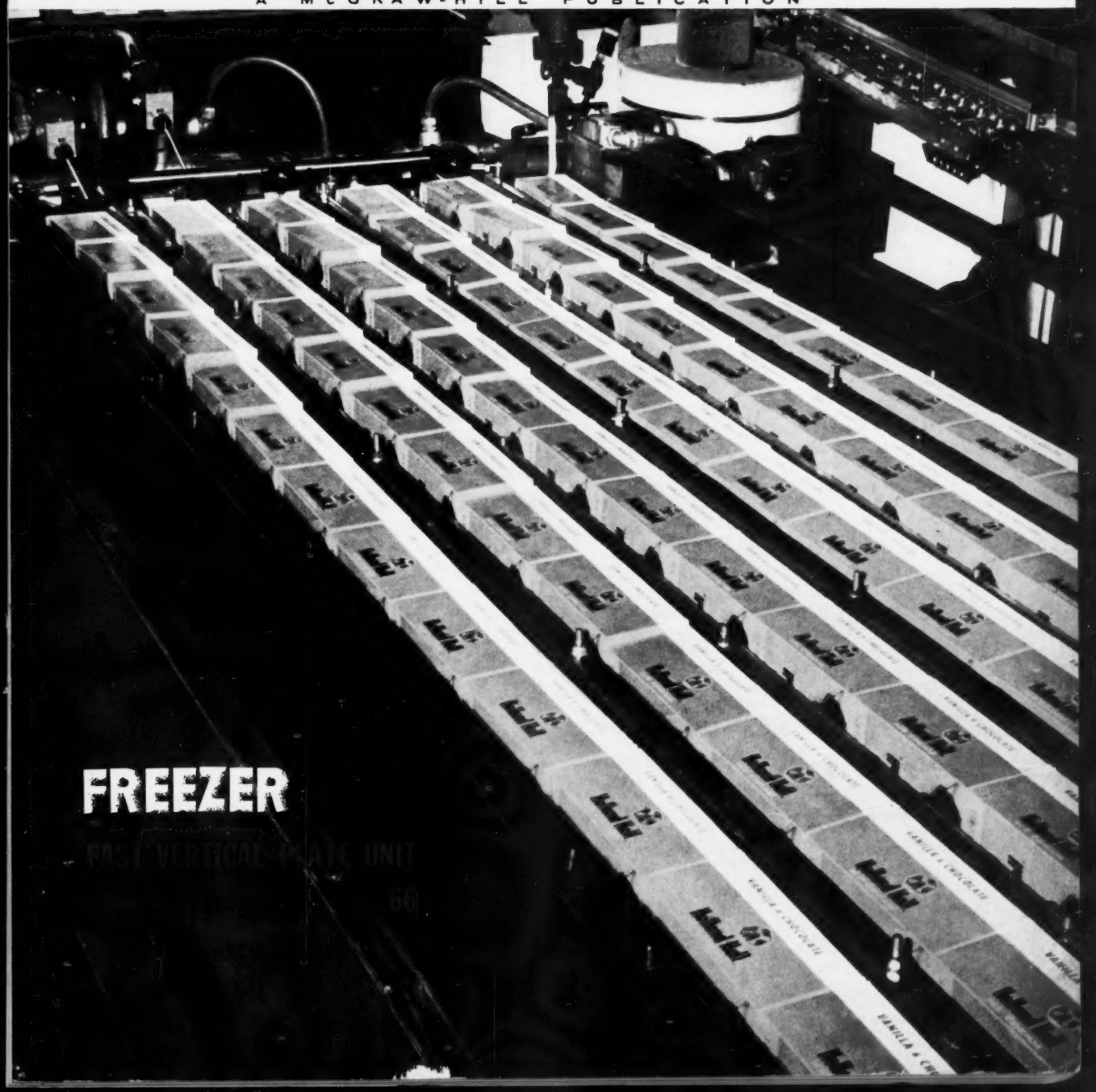

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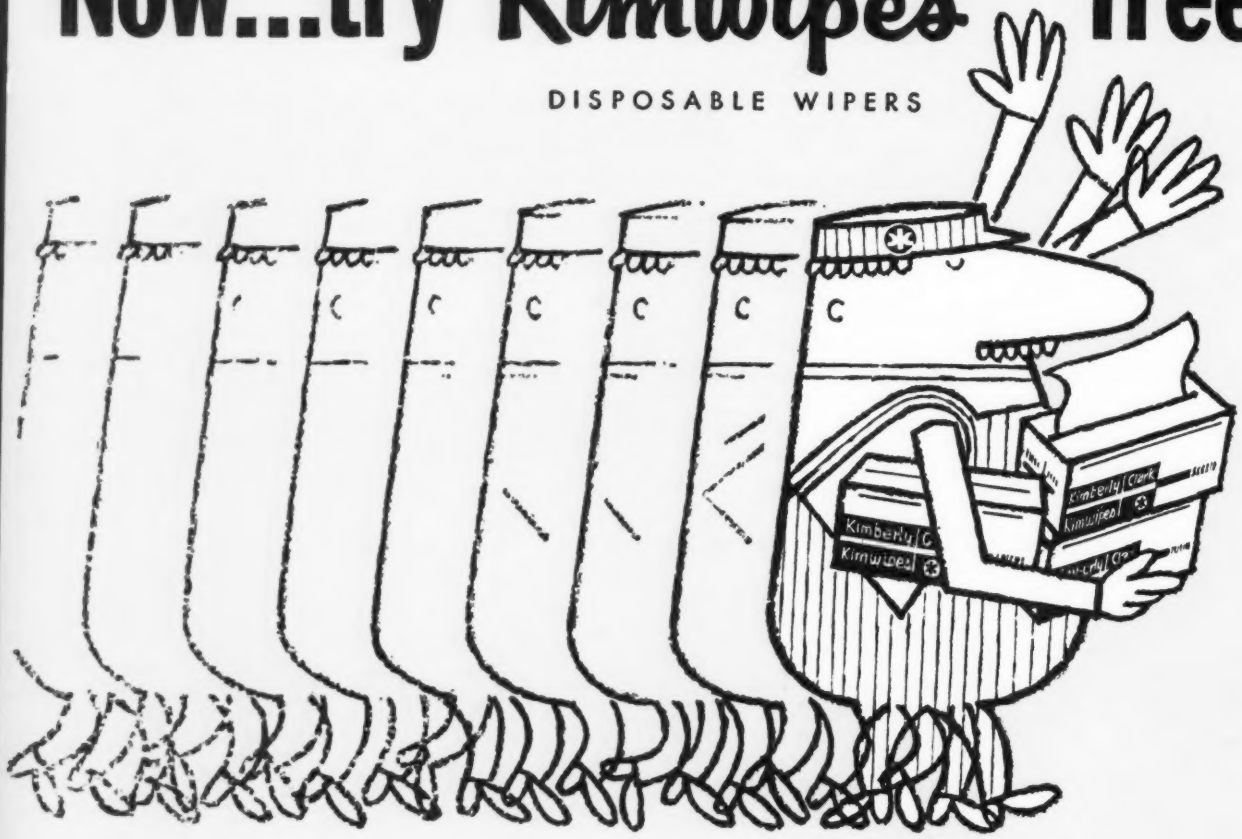

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FOOD ENGINEERING
FOR MANAGEMENT

APRIL 1960

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technical bulletin

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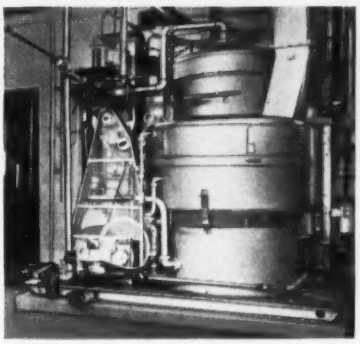

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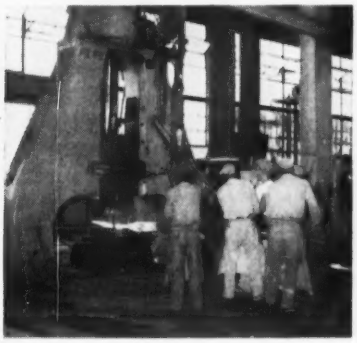

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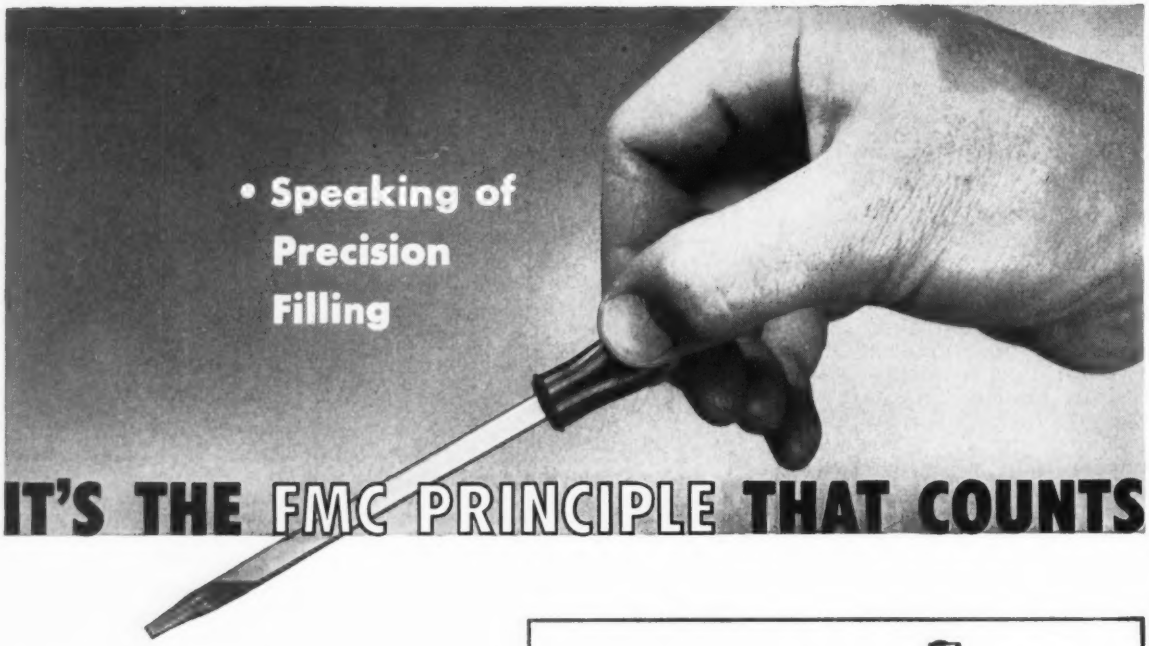

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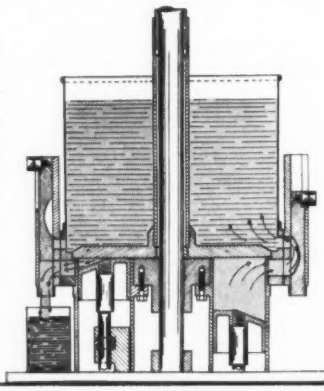
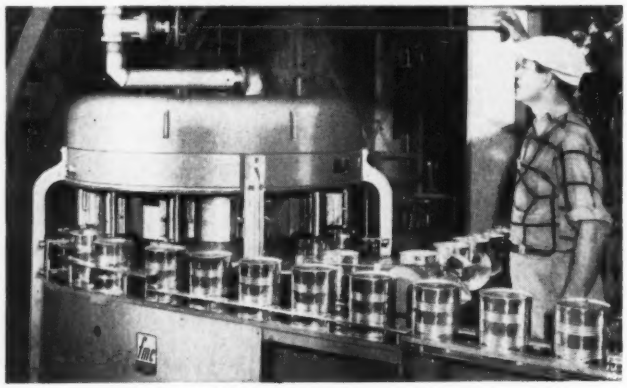


M&S 12 Pocket Filler at Bercut-Richard's Sacramento, California plant, filling paste in No. 10 cans at 72 cpm.



Putting Ideas to Work

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TRENDS & FORECASTS

SPECIAL

FOOD ENGINEERING

SERVICE to EXECUTIVES

Outlook for business still is bright for '60, and expectations are far greater for '61, according to McGraw-Hill Department of Economics.

Net income rose 14% in '59 for 111 food manufacturers; 18% for 34 beverage bottlers, First National City Bank reports.

Per capita food purchases may increase 15% in 15 to 20 yr., USDA predicts. Processed foods for home consumption are likely to gain half again as much as unprocessed items.

Increase in canned food consumption may be slightly less than for processed foods in general. But frozen foods may gain 40 to 50%, other processed items 25%, in 15 to 20 yr. Minor increases are expected for dried, cured and commercially baked foods.

Expansion by American food manufacturers into foreign markets continues. Heinz will build factory in Venezuela.

European market for processed citrus fruits is considered so good that Florida Citrus Commission will spend $178,000 there for advertising.

Because of rapidly growing British demand for frozen foods, Findus International, leading Scandinavian freezer, is building a plant in England.

Import of frozen tuna gained 26% in '59; canned tuna in brine, 22%; blocks of groundfish and ocean perch, 22%; fishmeal, 33%; shrimp, 25%.

Exports of fish oils were 54% higher in '59; canned salmon, 50%; canned sardines, 110%; canned squid, 63%.

Canned salmon pack dropped 34% in '59; Maine sardine pack 16.6%; Pacific sardine, 66%; anchovies, 94.5%. Tuna pack was up about 2%; mackerel, 47%.

Sales of carbonated beverages in cans increased 35% in '59 to 23-million cases. And '60 will see another 35% jump, American Can forecasts.

Confectionery sales gained slightly in '59 to 2.84 billion lb., valued at $1.166-billion, Commerce Dept. reports. Biggest volume was in bars and small items retailing for 1 to 10¢.

Sales of milk through vending machines nearly doubled last year to $85.6 million. Milk ranked fifth among vended items.

Civilian cheese consumption this year is forecast at 7.9 lb. per capita by USDA. This is 2½% below record in '58.

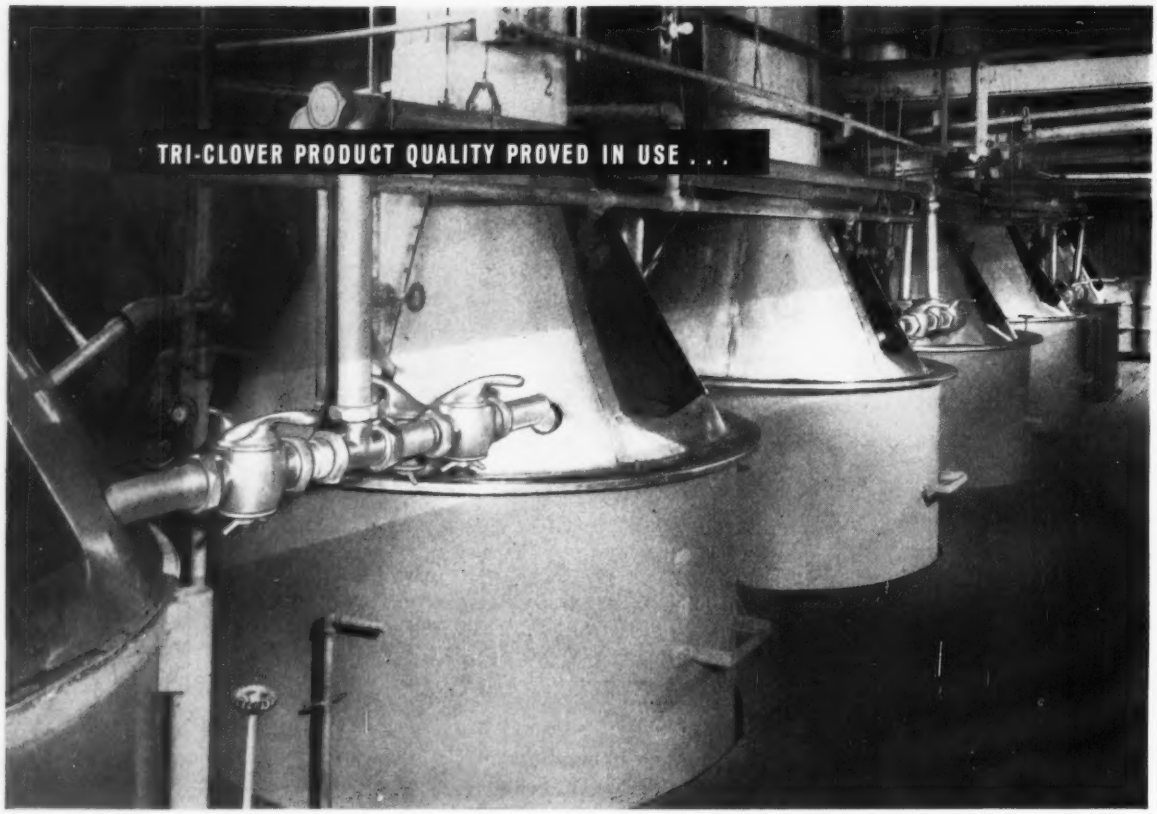
Canned pea and carrot pack totaled 1.75-million cases in '59, up 15%. Mixed vegetable pack declined 15% to 1.97-million cases; succotash gained slightly to 386,427 cases, NCA reports.

See Developments to Watch p. 13

Black raspberry pack decreased 18.5% in '59 to 195,572 cases; red raspberries, 10% to 72,109 cases. Strawberry pack gained 27.5% to 99,714 cases; blueberries, 1% to 566,194 cases, according to NCA.

Contracted acreage of green peas for processing will be 5% over '59, or 376,500 acres. Freezers plan 10% more acreage; canners, only 2% more.

Acreage of tomatoes for processing will be about same as in '59, but 15% below average, or 293,250 acres.

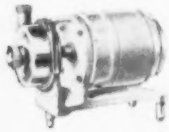


Tri-Clover stainless steel "standard" sanitary threaded fittings with bevel seat construction.

Tri-Clover Tri-Clamp fittings offer quick easy assembly and disassembly; long trouble-free fitting life.

Tri-Clover stainless steel valves are made in a full range of types and sizes to meet every requirement.

Tri-Clover full-flow magnetic traps employ an Alnico magnet to assure maximum removal of tramp metal.



Tri-Clover centrifugal pumps are fabricated of highest quality corrosion-resistant metals for efficient long-term service.

Series of Tri-Clover Valves serve HUNT FOODS Plant for almost 20 years

The "battery" of Tri-Clover stainless steel valves shown above are being used in the Hunt Foods, Inc. plant at Fullerton, California, in an atmospheric evaporator process for producing the well-known Hunt's tomato sauce. An "ordinary" installation, perhaps, except that *these same Tri-Clover valves have been giving reliable, trouble-free service in this plant for almost twenty years!*

Here is an outstanding example of the high quality material and workmanship that's "built-in" to the complete line of Tri-Clover stainless steel fittings, valves, pumps and tubing.

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Schedule of Events

April

19-21—Research & Development Associates, Quartermaster Food & Container Inst., convention; Congress Hotel, Chicago.
21-22—American Dry Milk Inst., convention; Edgewater Beach Hotel, Chicago.
30-M3—National Fisheries Institute, exhibit; Hotel Fountainbleau, Miami Beach.

May

1- 4—Flavoring Extract Manufacturers Assn., convention; Hershey Hotel, Hershey, Pa.
1- 5—American Assn. of Cereal Chemists, annual meeting; Morrison Hotel, St. Paul, Minn.
3- 5—Annual Industrial Waste Conference; Purdue Memorial Union Bldg., Lafayette, Ind.
4-14—U. S. World Trade Fair, exposition; Coliseum, N.Y.C.
8-12—American Society of Brewing Chemists, convention; Leamington Hotel, Minneapolis.
9-11—Biscuit & Cracker Manufacturers Assn., convention; Plaza Hotel, N.Y.C.
12-15—National Independent Meat Packers Assn., convention; Ambassador Hotel, Atlantic City.
15-19—Institute of Food Technologists, convention; Fairmont Hotel and Masonic Temple, San Francisco.
19-21—Refrigeration Research Foundation, annual meeting; Denver.

HORS D'OEUVRES

▶ **Italy is in the midst of a food adulteration scandal. Why not send Secretary Flemming over to straighten it out? Our food industry can spare him.**

▶ Low smoke-point cooking oils may be banned from submarine galleys. High fume-point garlic should be banned from subways, too.

▶ **Now USDA wonders what to do with $4.8 million worth of frozen caponette and turkey it bought off the market after the stilbestrol incident. It's only taxpayers' money.**

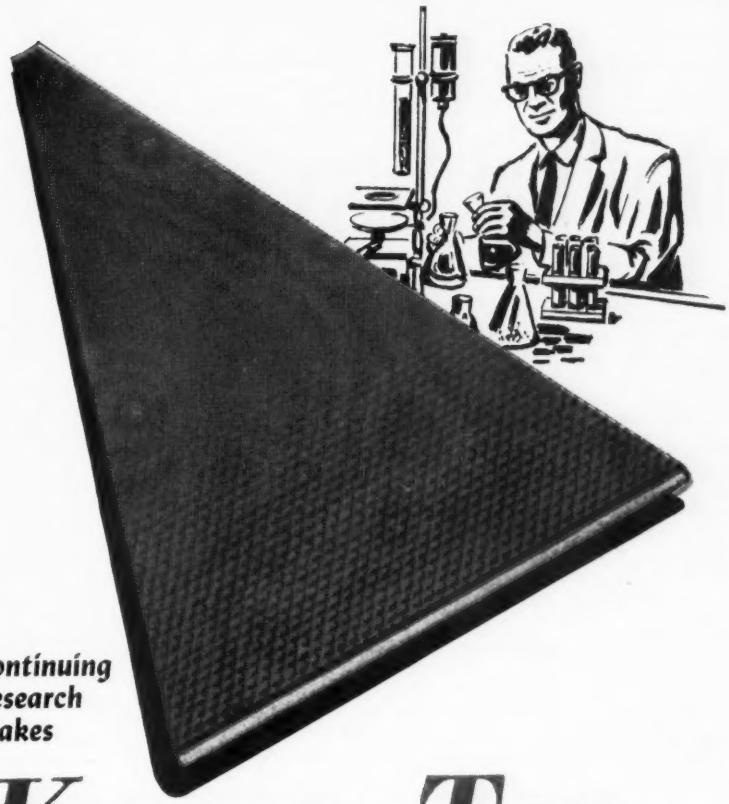
▶ Milwaukee is reported to have the lowest murder rate. Beer made it famous —not infamous.

▶ **According to Metropolitan Life height-weight tables, you are too fat if average by past standards. The insurance firm must not have any funds invested in food companies.**

▶ Best advertised brand in the U. S. is Brand X. Must be quite a market for it.

▶ **Grand Union opened a laundercenter alongside one of its supermarkets. Makes a profit on food going and coming.**

▶ A Minneapolis food plant worker recently collected $828 for injuries from falling on an icy sidewalk on her way to a coffee break. Seems that refreshment is part of the job.



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INSIDE SCIENCE

New Expanded Edition

The Vital Story of VITAMIN B_1

by Science Writer

(Thiamine)

Sailors, Chickens and Rice. Japanese sailors on Pacific cruises, chickens in an East Indian prison hospital yard, a Polish scientist working in London, a British biochemist at Cambridge, American doctors in the Philippines, chemists in the U. S. A. are all part of the world-circling vitamin B_1 picture.

Beriberi, the serious — sometimes fatal — disease with the pleasantly rhythmic name, is intimately connected with B_1. Research into the cause of beriberi helped in the discovery of B_1. Knowledge of the vitamin and its value to health also came from scientific studies of normal nutrition.

In the 1880's Takaki, a medical officer of the Japanese Navy, worked on the problem of beriberi which affected up to 40% of the sailors annually and was fatal to many. By supplementing the crew's rice with barley, meat, vegetables and condensed milk, he succeeded in practically eliminating the disease from the Japanese Navy in a few years. Of the fourteen cases of beriberi that occurred during this experiment, each had neglected to eat his daily allowance of the new foods.

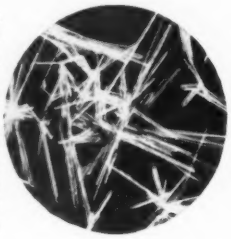
Fowl Experiments. Elsewhere in the Orient, a Dutch physician, Christiaan Eijkman, made two far-reaching observations: that chickens which lived in the bare yard of a prison hospital in the Netherlands East Indies had symptoms similar to those of his beriberi patients, and that these fowl fed on scraps of white rice from the prison table. Intrigued, he conducted feeding experiments with fowl, and caused the disease in them by a diet of polished white rice. Eijkman was honored with the Nobel Prize for his work.

Other demonstrations also showed that beriberi was caused by a deficiency in the diet. These findings led to investigations of the mysterious substance, present in some foods but absent in white rice, which prevented occurrence of the disease.

In 1912, two scientists working in Great Britain published significant reports. Hopkins, founder of the School of Biochemistry at Cambridge, discovered and reported that minute amounts of some unidentified substance were needed in the diet to promote growth and maintain health. The Polish scientist, Funk, then working in London, reviewed existing knowledge about beriberi, scurvy, rickets and pellagra. He suggested the theory that these diseases were caused by a lack of *vitamine*, a word he coined to describe the missing substance. Using extracts of rice bran, he tried to isolate the unknown element, which he knew acted against beriberi.

Rice Yields Its Secret. The deficiency theory was proved correct, but many years were to pass before the pure vitamin was isolated. Credit for this goes to two Dutch chemists, Jansen and Donath, who succeeded in preparing crystals of vitamin B_1 (thiamine hydrochloride) in 1926 from extract of rice polishings. Their success was confirmed by other investigators: Windaus in Germany, Peters in England, Ohdake in Japan and Van Veen in Java.

The Vitamin Described. With a faint, pleasant odor somewhat like yeast, and a nut-like and salty taste, thiamine hydrochloride is a white powder, easily soluble in water and slightly in alcohol. It is insoluble in animal or vegetable fats, although traces of the vitamin may be present in foods which are composed principally of fat.



In chemistry, the vitamin has this formula: $C_{12}H_{17}ON_4SCl \cdot HCl$. This means it is composed of carbon, hydrogen, oxygen, nitrogen, sulfur, and chlorine. Another form of vitamin B_1 is thiamine mononitrate, which has the empirical formula $C_{12}H_{17}N_5O_4S$ and is made of carbon, hydrogen, nitrogen, oxygen, and sulfur. The picture at right shows crystals of vitamin B_1 as seen through the microscope.

Names and Measures. Vitamin B_1 has been called by a variety of synonyms. Those surviving are *thiamine* (sometimes *thiamin*) in the U. S. A. and *aneurin* in Europe. When not otherwise specified, the name vitamin B_1 (or thiamine) ordinarily refers to the chloride hydrochloride salt. Recently another salt, the mononitrate, has also found commercial use.

The vitamin is customarily measured in milligrams, which truly are tiny quantities: one ounce contains 28,349.5 milligrams.

Men Make it. Man-made vitamin B_1 is so plentiful today that the years of study and work which led to the vitamin's successful synthesis may not be remembered.

For example, consider R. R. Williams, whose name is intimately associated with the vitamin. He began his work in Manila in 1910 when he was first interested in completely analyzing rice bran extract. A quarter-century of work followed, resulting in the synthesis or thiamine by himself and his co-worker, J. K. Cline. During these years, the vitamin had been isolated from natural sources, and its chemical composition learned. The next step was laboratory synthesis, which, as with many scientific events, was made by several groups at almost the same time. The Williams-Cline synthesis was announced in 1936. That same year Andersag and Westphal, and in 1937 Bergel and Todd, reported their syntheses. Still later (1952) Matsukawa and Iwatsu reported another synthesis.

Commercial Production. Before a man-made vitamin can be abundantly supplied, the laboratory procedures must be translated to commercial production methods. This was done for vitamin B_1 — with many important developments in technique made by the world-famous firm of Hoffmann-La Roche.

Long a leader in vitamin research and manufacture, Roche today produces pure, low-cost vitamin B_1 in huge quantities — "by the tons" — for use in pharmaceutical preparations, and in the enrichment, fortification and restoration of processed grains.

This man-made vitamin is identical chemically and biologically with the vitamin obtained from natural sources.

How Vitamin B_1 Works. Thiamine works within the living cells as an essential part of carbohydrate metabolism. As the body converts foods to energy through chemical means, it uses enzymes, which are necessary to the process. Vitamin B_1 is converted to its pyrophosphate, cocarboxylase, and acts as part of one of these enzymes. If too little of the vitamin is present, not all of the carbohydrate is used, and pyruvic acid builds up in the tissues and body fluids.

In human beings, vitamin B_1 is absorbed into the system through the small intestine. It is one of the vitamins which is needed daily, as the body does not store it in quantity. Only enough for a few days' needs is present at any time. Strangely, the body takes in only the amount of thiamine required for the time being. Any excess is excreted or destroyed.

How Much Do We Need? The Food and Nutrition Board of the National Academy of Sciences—National Research Council is universally regarded as an authority on our needs of essentials in the diet. It recommends that, daily, we have the amounts of vitamin B_1 given in the table below to maintain good health.

Daily Vitamin B_1 Needs in Milligrams

Men, age 25	1.6	Infants, 7 mos.-1 year	0.5
Men, age 45	1.5	Children, age 1-3	0.7
Men, age 65	1.3	Children, age 4-6	0.9
Women, age 25	1.2	Children, age 7-9	1.1
Women, age 45	1.1	Children, age 10-12	1.3
Women, age 65	1.0	Boys, age 13-15	1.6
Women, pregnant (2nd half)	1.3	Boys, age 16-19	1.8
Women, lactating	1.7	Girls, age 13-15	1.3
Infants, 2 mos.-6 mos.	0.4	Girls, age 16-19	1.2

Minimums Not Enough. A discussion of the Food and Nutrition Board's findings is contained in publication #589 of the National Academy of Sciences in Washington, D. C.

The Food and Drug Administration of the U. S. Department of Health, Education and Welfare has set *minimum* limits for vitamin B_1 in the daily diet. These are the figures used by most manufacturers as the basis for label statements that the stated quantity of the product provides a specified percentage of the minimum daily requirement of vitamin B_1. In comparing label statements of products, therefore, remember that a lower percentage in terms of the National Research Council's daily allowances for adequate nutrition may be the same or possibly higher than a percentage of the Food and Drug Administration's "minimum daily requirement."

Minimum Daily Requirement in Milligrams

Adults	1.0
Children, age 6-11	0.75
Children, age 1-5	0.5
Infants	0.25

How Physicians Use Thiamine. A serious prolonged deficiency of vitamin B_1 leads inevitably to beriberi, medically known as *multiple peripheral neuritis*. Symptoms appear in the nervous system, changes occur in the heart, and there is usually muscle swelling from excess fluid in the tissues. The disease can be fatal.

Beriberi Victim

Partial deficiency may cause fatigue, loss of appetite, headache, irritability, poor sleep, and disorders of the digestive system. Physicians administer pure vitamin B_1, often in substantial amounts and with other vitamins, to correct the situation. They may also advise changes in the diet and supplementary vitamin intake to prevent recurrence.

Everyone Won This Battle. The value of thiamine in helping to combat beriberi was dramatically proven on the Bataan peninsula in the Philippines. In Asian countries dependent mainly on polished white rice for food this sometimes fatal disease can be a problem. This is particularly true for infants who do not receive enough of the vitamin from their nursing mothers.

An attack, sponsored by the Government of the Philippines, the Williams-Waterman Fund and Hoffmann-La Roche Inc., battled the situation — with complete success. Using Bataan as a test area, beriberi fatalities were halted and far fewer residents showed symptoms of the disease. This dramatic change came about by simply enriching the people's rice with vitamin B_1, niacin and iron. The promise of better health was thus demonstrated to millions of people all over the world.

More Proof. Further dramatic proof of the value of *enrichment* came from a decision of the Government of Newfoundland at the time it was an independent colony, before it became a Canadian province. Because it was known that dietary deficiency diseases, including beriberi, occurred among the people, the government decided that all white flour which entered the area must be enriched with vitamins B_1, B_2, niacin, iron and calcium.

At the time of this governmental decision a health survey by nutrition experts disclosed that deficiencies of many vitamins, including thiamine, were present in the test sample of more than 800 persons. Four years later these experts conducted a resurvey. They found that symptoms of vitamin deficiency were markedly reduced in number and less severe and recommended the continuation of white flour enrichment. This was done. A final note: when Newfoundland became a province of Canada, it required that enrichment be continued on the island although it was not yet an established practice in the rest of the dominion. Of course, in Canada today the practice of white flour enrichment with vitamins and minerals is widespread.

Good Food Sources. Cereal grains, beans, peas, nuts, wheat germ, and pork can make good contributions to our daily needs of vitamin B_1. Many other foods, too, contain the vitamin in varying amounts. Unmilled cereals are excellent sources of thiamine but no one eats raw wheat berries, rice kernels, or dried whole corn.

Consumers demand *white* flour, *white* bread, *white* rice. During the processing of these foods, natural vitamin values can disappear with parts of the grain that are milled out.

Inexpensive Health Insurance. A simple, practical, inexpensive way of insuring that these foods supply important vitamins has been in use for many years in the U.S.A. This is the *enrichment* of white flour, white bread and rolls, macaroni and spaghetti products, corn meal and corn grits, farina, and pastina with vitamin B_1 (thiamine), vitamin B_2 (riboflavin), niacin (another "B" vitamin) and iron. Sometimes calcium is included. Other grain foods, such as rice, may be *fortified* with vitamin B_1, niacin, and iron; or, as in the case of processed breakfast cereals, the vitamin B_1 content may be *restored* to whole grain levels.

FREE REPRINTS. If you wish copies of this article and others in the series for reference or teaching, without charge or obligation, just send your request to Vitamin Division, Department of Education, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Limited, Vitamin Place, 1956 Bourdon Street, St. Laurent, Montreal 9, P. Q.

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The new Edlund Portable will open 500-750 cans per hour for you, depending upon your production set-up, leaving smooth edges on every can.

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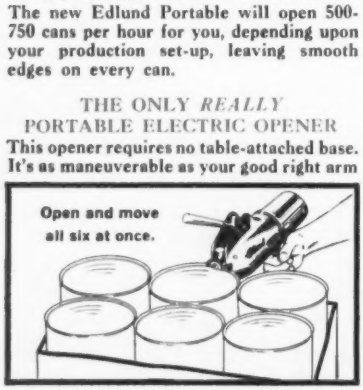
This opener requires no table-attached base. It's as maneuverable as your good right arm and operates with complete efficiency in any production set-up... single can, assembly line, or cans in the case.



STOP MOVING HEAVY CANS!

Just move the Edlund Electric from can to can. It weighs less than a #10 can and is perfectly balanced for easy handling. The pistol grip with trigger on/off switch gives you absolute cutting control.

PAYS FOR ITSELF IN SHORT ORDER

In large or small volume, the Edlund Portable's speed and durability will save you enough time and money to pay its cost many times over. It is simple to clean because you can really "get at" all cutting parts. It works as well on a sardine can as on a #10 can and, in actual kitchen tests, has opened hundreds of thousands of cans and still performs perfectly.

CHECK THESE VERY VITAL STATISTICS

The new Edlund Portable Electric Can Opener has an AC-DC Universal Heavy Duty Motor, is UL approved with 3-prong ground wire safety plug. The motor housing, opener assembly and handle are die-cast aluminum for maximum strength with minimum weight. Both cutting wheel and gear are of hardened tool steel to assure smooth cutting and long wear. Magnet (optional) eliminates "fishing" for lids. Equipped with hang-up bracket, this opener stores out of the way. Provision is also made for permanent installation, if desired.

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DEVELOPMENTS TO WATCH

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FOOD
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New irradiated polyethylene food packaging film will stretch two-fold, and shrink 20% when exposed to heat. Five times as strong, the poly has molecular structure modified by bombardment with 2 million volt electron beam. Produced by Cryovac, film is competitively priced, is in commercial use.

Developed for rapid determination of pesticide residues, by Stanford Research Institute, new microcoulometric gas chromatography apparatus separates pesticide constituents, combusts them, titrates and reacts with silver ion. Titration current is recorded as function of time.

New shortening for bakers is fluid, for pouring and pumping to cut handling costs. Durkee development consists of vegetable oil emulsified with glyceryl lactosterate and mono- and diglycerides.

Rusting of filled tin cans during processing in water is inhibited by new Banox compound developed by Calgon. A few ounces treat 100 gal. of water.

New chill-proofer for beer and wine has been discovered by Dow Chemical. It is an oxazolidinone powder made from basic chemicals like acetylene.

Canned creamed olive soup produced experimentally at University of California is reported to be tasty. Pureed pickled ripe olives blend well with pea and potato soups. New outlet for undersize olives?

Broken pieces of shrimp from canning and breading operations are salvaged and sold as low-cost quality item, canned or frozen. Product is now used in cookery demonstrations by Bureau of Fisheries home economists.

Polyethylene screw caps for bottles have been developed with built-in flexible sealing ring. Competitive price-wise with metal caps, these require little torque for tight seal. Made by Dover Molded Products.

Oil-resistant ink system for polyethylene film is offered at no extra cost by Continental Can. Oily food wraps can be printed in five colors.

Computer centers to serve small businesses on short-order basis are being established in nation-wide setup by National Cash Register.

See
Who's
Building What
p. 17

New analytical technique involves bombardment of substance with neutrons. Each element develops different radioactive pattern for identification.

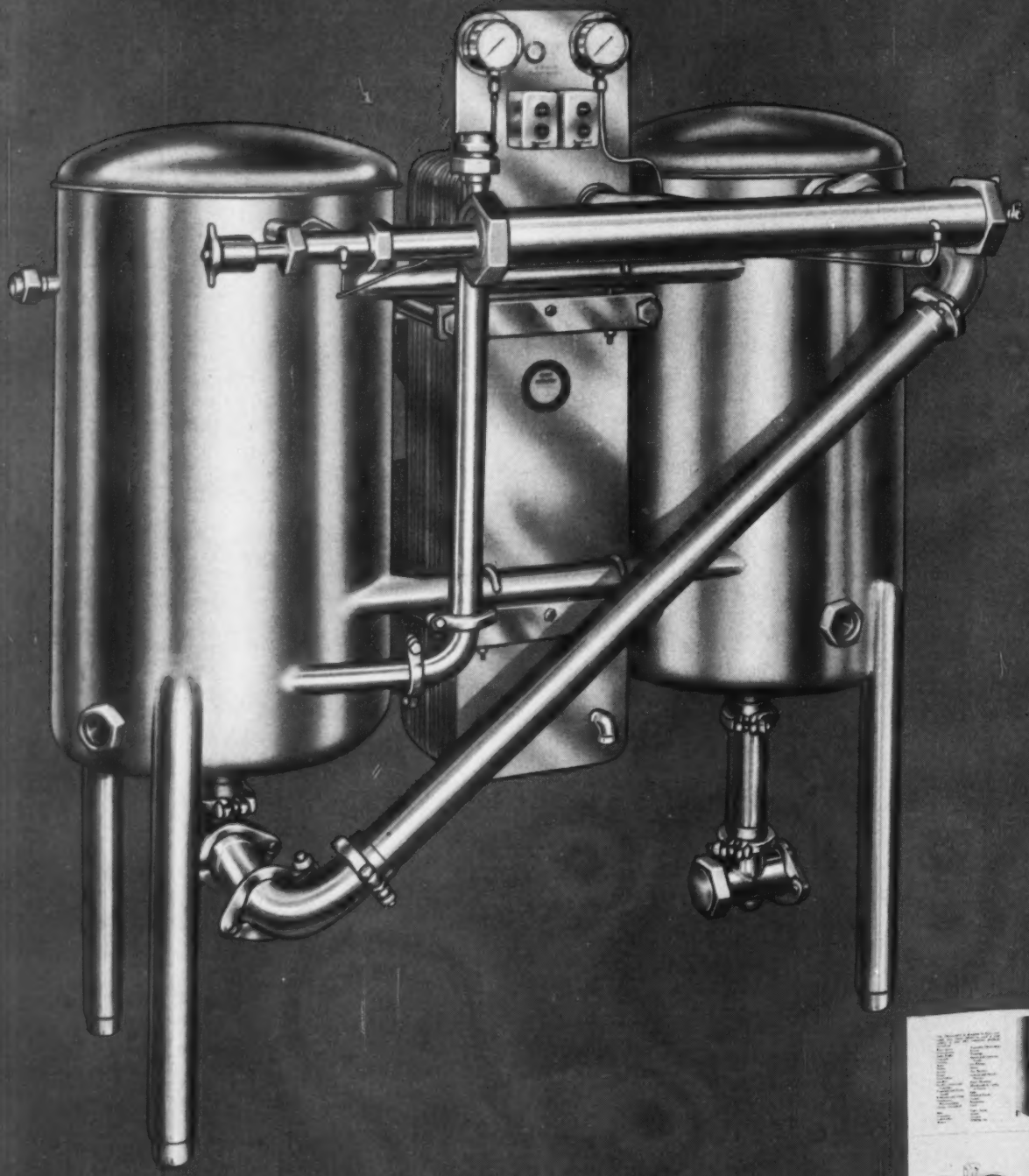
Nitrogen fixing enzymes have been isolated from bacteria by Du Pont researchers. This may lead to duplicating bacterial processes economically, or stimulating them artificially, to increase productivity of soil and boost food production.

Giant 80-ft. biological spectrograph is being used as molecular spotlight to study processes in plant and animal cells at Argonne National Laboratory.

Washington
Report
p. 19

Experimental 26-stage flash evaporator will convert sea water to fresh at rate of 100,000 gal. or more daily. This Southern California Edison operation is seen as important step toward economical desalting of ocean water.

Europeans are spending more than 100 times as much on candy research as Americans, says confectionery technologist Hans F. Dresel.



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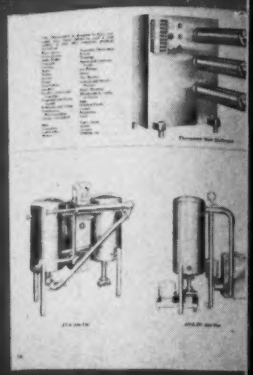
HEAT AND VACUUM TREATMENT
PROTECTS NATURAL JUICE FLAVOR



Profitable Brands Start With Cherry-Burrell Processing Equipment

Stokely Van Camp uses Cherry-Burrell Aro-Vac to protect the natural juice flavor

Refreshing. Cool. Delicious. The fresh flavor of newly picked and just squeezed oranges rates Pictsweet and Stokely's Finest two of the popular first choice brands. Homemakers can rely on that refreshing flavor. They buy with confidence again and again.

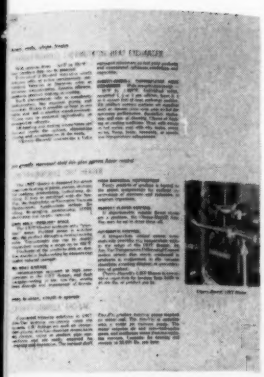
Stokely Van Camp, Inc. relies on Cherry-Burrell Aro-Vac Flavorizers to keep Pictsweet and Stokley's Finest tasting uniformly fresh. To take peel oil flavor out without damaging the delicate, natural flavor of the juice.

Cherry-Burrell Aro-Vacs use a steam and vacuum treatment to remove unwanted odors and taints from any liquid. The product is first quickly heated with purified, dry, unsaturated steam. The heat volatilizes unwanted materials and they are drawn off as vapor from chamber top. Then the product enters a vacuum chamber where condensed steam flashes into vapor and is pumped away with other gaseous off-flavors.

The instantaneous heating and cooling eliminates any heat damage. Doesn't change the natural flavor.

A Cherry-Burrell Sales Engineer will be glad to show you how an Aro-Vac Flavorizer will improve your product's flavor. Keep it uniformly good. And sell consistently. There's no obligation whatsoever. Call or write him today.

Equipment for flavorizing, homogenizing, heating, cooling, storing, separating, freezing, mixing, packaging and conveying.



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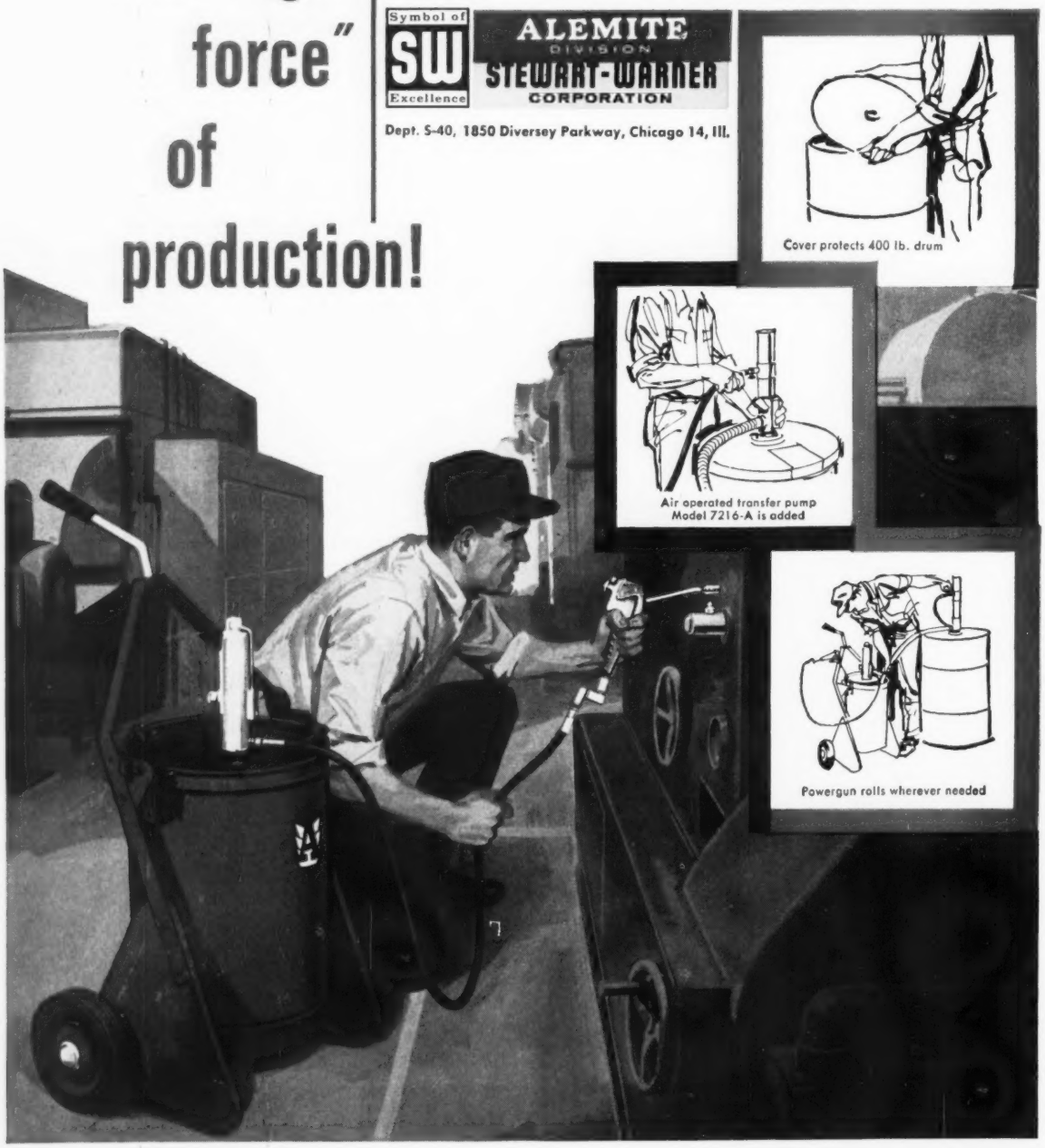

Cover protects 400 lb. drum

Air operated transfer pump Model 7216-A is added

Powergun rolls wherever needed

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CIRCLE 16 ON READER SERVICE CARD

WHO'S BUILDING WHAT...

Monthly Report: Food firms to spend $25,287,590 for expansion.

Proposed Work

Anheuser-Busch, Inc., San Fernando, Calif., brewery, $6,000,000.

Carnation Co., Oakland, Calif., ice cream plant, $1,000,000.

Falstaff Brewing Corp., Galveston, Tex., brewery additions, $5,805,000.

General Foods Corp., Canandaigua, N. Y., processing and refrigeration plant, $2,000,000.

National Biscuit Co., Stamford, Conn., warehouse, $110,000.

Old Reading Brewery Co., Reading, Pa., warehouse, $375,000.

Pfaelzer Bros., Chicago, Ill., meat processing plant, $750,000.

Red Dot Foods, Rhinelander, Wis., garage & warehouse, $250,000.

Royal Crown Bottling Co., Chattanooga, Tenn., plant, $115,000.

Simpson Meat Packing Co., Fayetteville, Ga., plant, $130,000.

Thomas Bread, Inc., Totowa, N. J., bakery, $2,500,000.

Contracts Awarded

Armour & Co., Bellwood, Ill., research building, $350,000.

Canada Dry Beverage Co., Houston, warehouse & plant, $150,000.

Cariboo Growers, Oroville, Ore., cold storage & packing room, $500,000.

Idaho Industries, Inc., Burley, Idaho, potato processing plant, $2,000,000.

Mary Ann Baking Co., Chicago, Ill., bakery, office & garage, $200,000.

McDonald Candy Co., Eugene, Ore., warehouse, $172,590.

Pepsi-Cola Bottling Co., Detroit, Mich., bottling plant & office, $500,000.

J. M. Smucker Co., Salinas, Calif., plant & warehouse, $1,000,000.

Standard Brands, Inc., Chicago, Ill., warehouse & office, $375,000.

State Poultry Co., Jackson, Miss., poultry processing plant, $205,000.

Stayton Canning Co., Stayton, Ore., warehouse, $325,000.

Sweet Sue Poultry, Inc., Athens, Ala., meat processing plant, $150,000.

Wakefern Food Corp., Elizabeth, N. J., warehouse, $325,000.

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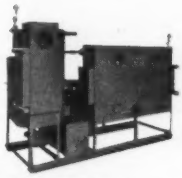
offer high performance with new low maintenance for years of troublefree service



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Rugged new Kathabar design provides all-nickel regenerator, separate from rest of system, to prevent condensation corrosion. Breaking all records for low maintenance, all over the world.

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Successfully applied in wide range of industries, hospitals, buildings. Easily provide conditions of 80° F and 35% RH to 30° F and 10% RH. Deliver air at -90° F dew point.

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city ..... *zone* ..... *state* .....

59-7

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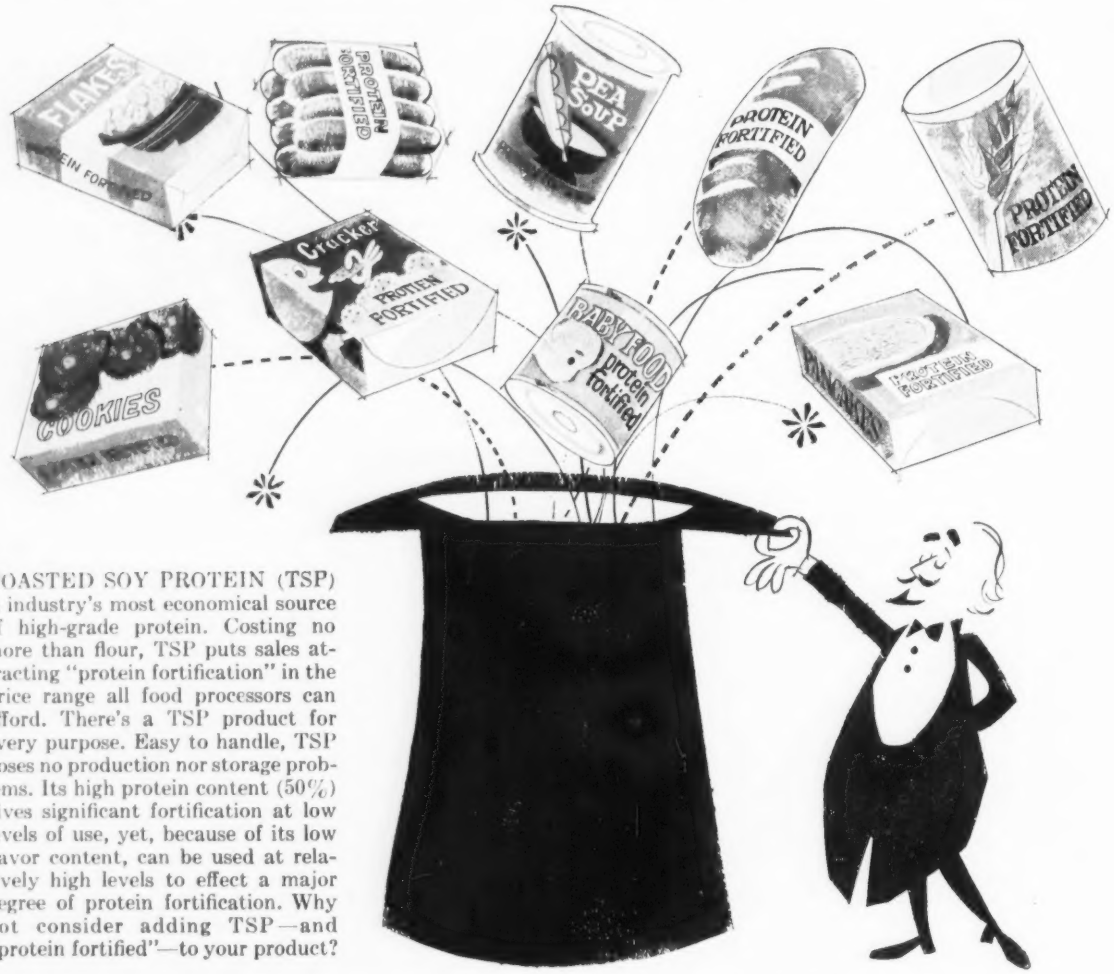
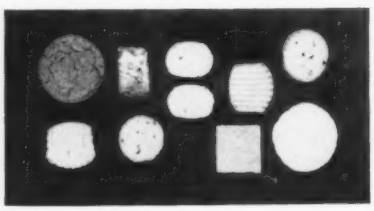
Add General Mills **TOASTED SOY PROTEIN** *to your product*
. . . and the magic words **"protein fortified"** *to your package*



TOASTED SOY PROTEIN (TSP) is industry's most economical source of high-grade protein. Costing no more than flour, TSP puts sales attracting "protein fortification" in the price range all food processors can afford. There's a TSP product for every purpose. Easy to handle, TSP poses no production nor storage problems. Its high protein content (50%) gives significant fortification at low levels of use, yet, because of its low flavor content, can be used at relatively high levels to effect a major degree of protein fortification. Why not consider adding TSP—and "protein fortified"—to your product?

Is there a success opportunity here for you?

Sausage makers use TSP to reduce binder costs. Seeking to improve profits without loss of product quality, sausage makers are adopting TSP because of its low cost as their choice of "legally permitted binders." TSP's high protein content makes it the perfect complement to meat.



Cookie makers use TSP in fast selling specialties. TSP permits the cookie and cracker baker to produce delicious high protein specialties that "bite easy and chew tender." Now, through use of TSP, new character and sales appeal can be added to all types of cookie and cracker specialties.

Package Food processors find TSP ideal for creating new high-protein line. TSP is easy to incorporate in most formulas, can transform your present product line into a parallel-line of "protein fortified" items—adding to your total share of the market, profitably.

Get all the facts today! Learn how you too can use TSP to create entirely new food products or to enrich existing ones. Write, wire or phone . . .

OILSEEDS DIVISION
Minneapolis 26, Minnesota

General Mills

See Sugar Flow Safe—Despite Castro

No matter how bad they may become, U.S.-Cuba relations aren't seen throwing our sugar market out of kilter. At least, not for the next two or three years.

Ike has asked Congress for new authority under the U.S. Sugar Act—now up for extension—to re-allocate foreign import quotas "in the national interest."

It's no better than an even bet that he'll get this power. But even if he does, he wouldn't cut the Cuban total unless Castro gets a lot rougher with U.S. interests.

Should that happen, some of the Cuban quota is seen going to other Latin American nations—without any market rupture looked for.

Sugar demand would push up domestic prices only if Cuban imports were drastically cut below competing potentials. Conversely, Cuba's heavy new low-price sales on the world market aren't seen pushing down the world price—unless Castro deeply diverts sugar from the U.S. (not likely in view of Cuba's dollar shortage).

Pressures to change the Act to benefit U.S. beet growers may now step up. But these pressures are expected to be resisted by both Congress and Administration.

Map Food Plan for Attack Emergency

You get a clearer idea, from new reports by USDA and OCDM, as to food action in an attack emergency.

It's planned that local civil authorities would team with area USDA men, the former checking retail food inventories, the latter assessing farm, processor, warehouse, and wholesaler stocks.

When necessary, USDA officials would freeze supplies prior to retail distribution, then direct a controlled flow of these goods as required. Food holders failing to release stocks deemed needed could have their supplies "requisitioned in the name of the U.S."

Primarily, citizens would be responsible for maintaining personal stocks sufficient for the first two weeks of such an emergency period.

At federal level, USDA would be prepared to release government crop-surplus supplies—considered as "national stocks for use in the best interests of the nation."

BRIEFS

Orange-juice labeling to show processing is required by FDA's new standards—calling for specific wording, as "Made in part from concentrated juices," and "Made in part from water extract of orange pulp." June will be effective date—unless objections are sustained. And kicks may be expected on such points as the "water" phrasecology—considering process is merely a matter of putting back in the juice what was there in the first place.

FDA's shots against deceptive packages—those with false ends, stuffing, etc., supplanting seemingly promised contents—aren't piercing enough legal armor. With loss of a prime test case vs. a candy-mint maker, the Agency is seen concentrating its artillery on the more vulnerable short-weights.

New, terse additive-front booklet (44 pages) sharply focuses on "Problems in the Evaluation of Carcinogen Hazard From Use of Food Additives." You can get this key-factor reference for $1 from The National Academy of Sciences, National Research Council, 2101 Connecticut Ave., Washington, D. C.

New major food-irradiation research plan, drafted by multi-agency committee, calls for a $12-million outlay for double-header AEC and Army study projects running over 6 yr. But high hurdles loom, since Sen. Clinton Anderson and others on his Senate-House Atomic Energy Committee favor a low-cost approach through AEC—with the Army left out of the picture.

Foodmen Seek Smoothing Of Additive Actions

They look for USDA plea to bear weight at White House in implementing "restraint and common sense"

SEEN PERTINENT by food-industry interests is a softening of the impact of the new, stringent additive regulations.

They look to USDA to supply some pressure. At the same time, they're trying to live with the new food controls activated Mar 6 when the law took effect.

It's expected that the agriculture experts will enter a plea for restraint and common sense in enforcement when they fulfill Ike's request (FE Mar., p. 19) for reports on the problem from key departments.

USDA will ask that the law be modified to allow scientific discretion on agents which might cause cancer, rather than flatly ban them. Their arguments will be weighed by the Budget Bureau against reports of scientists from the National Cancer Institute and HEW. Then the Bureau will recommend to the President what stand he should take.

Agriculture scientists contend that the so-called Delaney Amendment flatly outlawing any ingredient which can cause cancer in test animals is a politically imposed edict in an area where scientific judgment should prevail. They will point out that scientists not only differ on how much of a carcinogen can be permitted in food, but also on what compounds are carcinogens.

Selenium, for instance, can cause cancer under certain conditions. But it is a natural component of animal feed and without it the animal's diet is deficient.

Watch for Congress Reaction

How much weight their arguments carry will be reflected when Congress votes on a bill to bring coal-tar colors under the same kind of regulation as other food additives. The bill has passed the Senate without a "no-cancer" amendment and is now being considered in the House Commerce Committee. HEW Secretary Flemming has asked for a Delaney Amendment because doctors at the National Cancer Institute insist that nobody knows whether "a little bit of cancer" is all right.

As the additives law went into effect, industry feared that a number of the 2,000 additives now used might abruptly be banned. Actually, none has been banned so far. And FDA officials don't expect that more than half a dozen will be, when all is said and done.

Continued→

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Additive Actions (Cont'd)

A substance used in some soft drinks and an ingredient of certain salad oils are suspect. Earlier, carbon black, ultramarine blue, and oil of wintergreen were "hung up" as not obviously safe, but will probably get tolerances in due time.

Some 600 additives have already been exempted as "commonly recognized" by scientists as safe. One-year time extensions have been granted 200 or more other substances. Companies have petitioned (with supporting test data) for clearance of several hundred more. Here, FDA is allowing continued use of the products until they are either approved or disapproved, meantime keeping its researchers hard at work clearing the pile of applications.

Furor in Packaging Factors

More difficulty has been kicked up in the packaging field. Substitutes have had to be used for some toxic chemicals in paper which might migrate to food. Polyethylene wrap initially posed a problem because of a toxic ingredient that could migrate to fatty meats. But producers say their new way of making it clears this up, and FDA approval is expected. The packaging industry has generally been accorded a year's extension on proving safety of its products, because its checking of additive factors is new, demanding testing from scratch.

Meantime, the oil industry is well under way with a $150,000-a-year program testing waxes used on paper and dairy cartons. This crash program has already yielded hopeful results. American Petroleum Institute has petitioned FDA to clear two types of wax that have checked through as free of carcinogens.

Makers of sealing adhesives have already asked clearance for 195 of their most commonly used chemicals.

Food processors press packaging-materials manufacturers to assure them that they won't suddenly get stuck with foods packaged in materials that don't meet the new requirements.

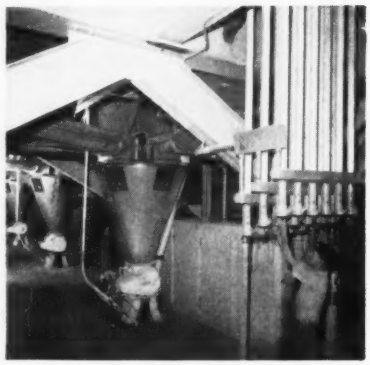
Ever-Present Threat

Thus, a pack of worries beset the food industry as it moves into the new era of regulation. Nobody knows what might be the next cranberry-type incident.

The enormous flow of chemicals in agriculture—212 pesticides now in use compared with a half-dozen 20 yr. ago—means an ever-present threat of misuse. Some chemicals

Problem:

To cut cost of conveying, storing and blending flour



Solution:

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PNEU-FLO® SYSTEM

With just one man on each shift, the C. F. Mueller Company unloads, blends and distributes 125,000,000 lbs. of flour a year at its six-story plant in Jersey City. Sprout-Waldron's bulk handling and Pneu-Flo positive pressure system recently installed has saved more than 25,000 square feet of floor space, reduced handling costs by $150,000 per year, freed more than $40,000 worth of equipment, simplified close check weighing of incoming raw materials, increased safety and reduced housekeeping and maintenance.

The system unloads and conveys to storage a minimum of one carload of flour in four hours; provides maximum diversity of storage; sizes all incoming material at a rate equal to or greater than the unloading rate; transfers the material at rates of 30,000 lbs. per hour.

The full story of this reliable pneumatic handling system is told in Bulletin I-57. Copies are available on request.

CW/105

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Bulk Materials Handling • Pelleting

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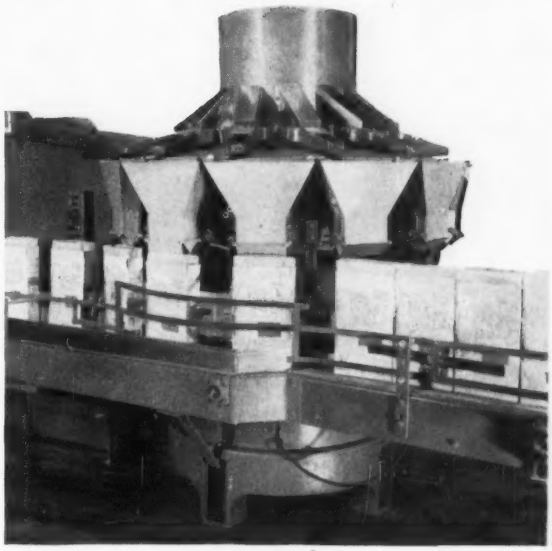
. . . *as in* WRIGHT *weighers*

Included in the Wright line of packaging machinery is a wide variety of weighing equipment.* These machines differ in function but each has this common characteristic: precision accuracy. Wright customers abhor waste. They refuse to condone overweights. Mail the coupon below for tell-all literature.

* *Examples of other Wright machines are the Wrightwrap® for wrapping, sealing, and labeling cracker sandwiches, and the Strip Stamper for applying revenue stamps to bottles.*

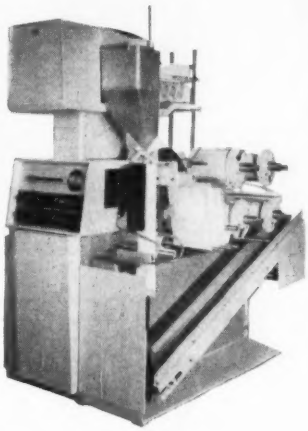


WRIGHT NT WEIGHER

Rotary net weigher for packaging the total output of a continuous production process such as a bakery oven. Synchronized carton flow. Range: 3 to 16 oz. Speed: 70 to 120 per minute.

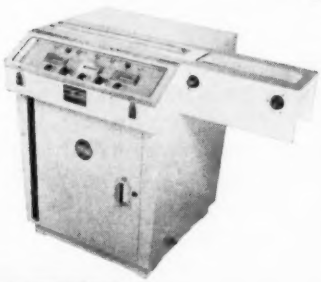
WRIGHT Advanced Bagmaster®

Completely automatic bag forming-weighing & filling-sealing system. Produces up to 45 pillow-type packages per minute in range from 2½ to 8 inches in width and from 3 to 14 inches in length. Advance features permit the precision and accurate packaging of fragile and multi-dimensional products.



HY-TRA-LEC® Weigher M

Complete line of semi-automatic and automatic, single head and multiple head net weighers for packaging free-flowing, dry products into any type package. Utilizes Wright's patented Hy-Tra-Lec weighing method. Precise. Rugged. Range: ½ to 16 ounces.



WRIGHTRONIC® Checkweigher

Electronically gross weighs each package at speeds up to 150 per minute and (1) signals whether package is overweight, on weight, or underweight, (2) registers a running visual count in each weight classification, and (3) rejects any package outside plus or minus limits. Range: 4 ounces to 2 pounds.

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DIVISION OF SPERRY RAND CORPORATION
DURHAM, NORTH CAROLINA

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( ) HY-TRA-LEC® WEIGHER

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NAME.....

COMPANY.....

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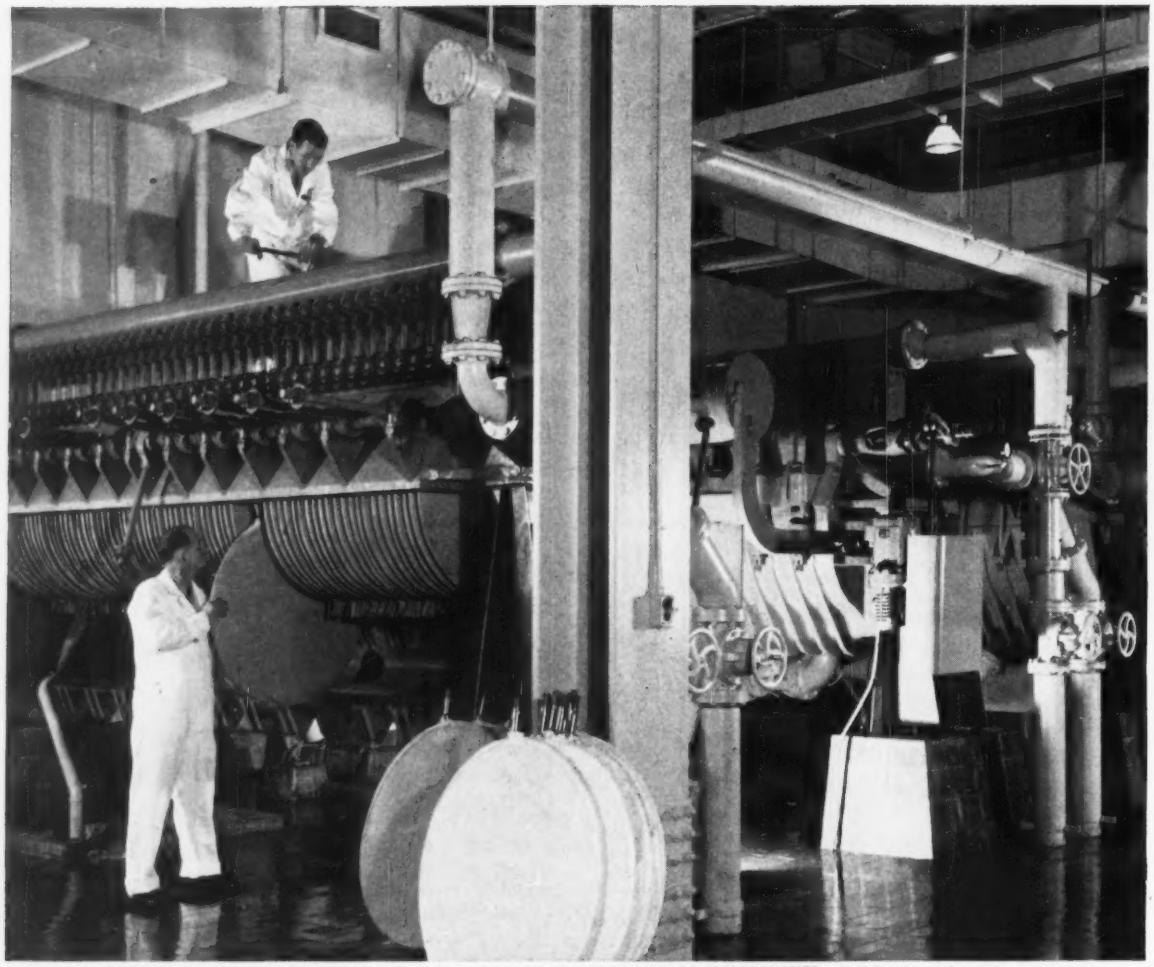
CITY & STATE.....



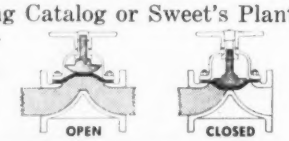
SWEETLAND PRESSES AT REDPATH SUGAR EQUIPPED WITH GRINNELL-SAUNDERS DIAPHRAGM VALVES—At this stage of refining, raw sugar has already been washed, dissolved, mixed with lime — and the lime and impurities in sugar precipitated with carbon dioxide gas. The resultant mixture is filtered through the Sweetland press to remove precipitant. Workmen are shown replacing the leaves in one of the Redpath Sweetlands.

Keeps sugar crystals from abrading working mechanism, avoids valve sticking, and prevents product leakage

A big problem in refining sugar is to prevent damage to the working mechanism of the usual type of valve by the eroding action of sugar crystals. Failure to do this means that sooner or later valves won't close tightly — resulting in messy, unsanitary, costly-to-repair leaks.

At Canada and Dominion Sugar Company's Redpath Refinery, in Toronto, Canada, Grinnell-Saunders Diaphragm Valves help avoid these problems. The diaphragm separates working parts from the fluid stream — preventing erosion of valve mechanisms on the one hand, and sticky or "frozen" valves on the other.

Grinnell-Saunders Diaphragm Valves are available in a wide range of body, lining and diaphragm materials. For more details, see Grinnell's insert in Chemical Engineering Catalog or Sweet's Plant Engineering File — or communicate with the Grinnell Company.



GRINNELL-SAUNDERS DIAPHRAGM VALVES

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Additive Actions *(Cont'd)*

can come through highly toxic if doses are too strong or spraying too close to harvest time. Innocent food dealers can get bogged under a whole crop of unsalable spinach, for instance, if farmers misuse a chemical spray and a government official then says "Don't eat spinach." As protection against misuse, National Canners Assn. has prepared raw-material guarantee forms and rejection slips for processors to use in buying from farmers.

Cited as a possible threat is use of stilbestrol in animal feeds. This substance is considered a carcinogen where residues show up later in the meat. Finding of residues in chicken livers and skin has already brought confiscation of products.

Perhaps the new testing methods will likewise turn up minute quantities in beef. If so—per present law—stilbestrol would have to be banned and existing beef confiscated. And agricultural experts say the price of beef would go up 10% if the fattening agent could not be used.

"Can Be Carried Too Far"

"Originally, when we talked about contamination of food we meant real contamination," says USDA Research Director M. R. Clarkson. "Today, we are talking about parts per million. And perhaps tomorrow we will be talking about parts per billion or trillion, really insignificant. This thing can be carried too far."

Secretary Flemming has asked Congress to change the food additives law in two respects—one tightening it, the other making it more flexible.

First, he seeks dropping of the "grandfather" clause, which has blanketly covered chemicals that were granted formal approvals before the new additives law went into effect. Any holder of an earlier approval can go on using the chemical until the government proves it unsafe—which could mean a long time. On the other hand, another company which now wants to make the same product must first prove it safe before being eligible for a permit. This amounts to a "running monopoly" for those who were "in early." Stilbestrol for cattle feed is one example.

Other change Flemming wants is permission to approve carcinogens for use in animal feed ("food" by legal definition) when no residues show up in the meat. Thus, new applications for stilbestrol could be readily approved.

FDA Commissioner Larrick says he doesn't know of any substances

SILICONE NEWS from Dow Corning

All Product...No Foam

Dow Corning Silicone Defoamers Keep Production in High Gear

Peak season processing of beans, peas, carrots and other vegetables – pickles and fruit, too—can't wait on foam. That's why more and more food processors are using Dow Corning silicone defoamers to keep foam under control at all times.

Whether yours is vegetable processing or some other phase of the food industry, foam robs you of production space, slows processing, increases maintenance, causes boil-overs and waste — may even create fire hazards!

IN FREEZING MIXES

Stop foam before it starts. Easy to use, fast-acting Dow Corning silicone defoamers won't contaminate your products . . . are completely safe in packaging and processing. Dow Corning Antifoam A may be used in nonstandard foods at concentrations to 10 ppm; and water-dilutable Antifoam AF Emulsion at concentrations to 34 ppm.

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Essential Chemicals From Hydrocarbon Sources

155

Additive Actions *(Cont'd)*

now protected by the grandfather clause that would have to be banned if it were repealed, although "there are some we're not sure about."

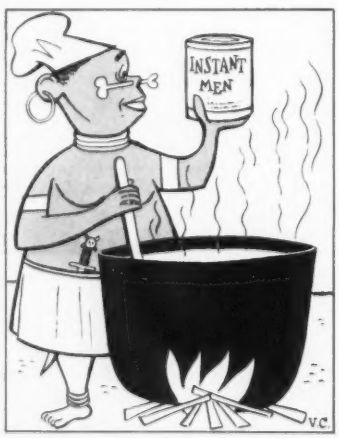
The food and chemical industries are dead opposed to the "grandfather" repeal. They say the public is well protected because the government can ban substances it shows to be harmful. And the expense of testing the many agents—in use for years without demonstrable harm—would be an enormous and disrupting burden on the industries.

Having worked hard to get the clause included in the original legislation, they wouldn't give it up now without a fight. At present, there seems to be little support in Congress for revoking it.

It's delicate: No food, chemical, or packaging people want moves that might stir up public misconceptions that they're soft relative to taking chances with health. But after suffering through the Flemming cranberry and caponette mishmashes, they wish the Secretary would be less knock-down-and-drag-out in applying the law.

Manufacturing Chemists Assn. and other trade groups are relying more on private contacts with responsible government officials to try to head off disastrous incidents. Meat field representatives, for instance, say they have private assurances that no further pronouncements of the "Don't eat cranberries" type will be made by Flemming without prior efforts to clear up such situations directly in the spheres affected.

Beyond that, food industry groups are waiting and watching to see what stand the White House takes after getting the consensus of the various scientists. —*End*



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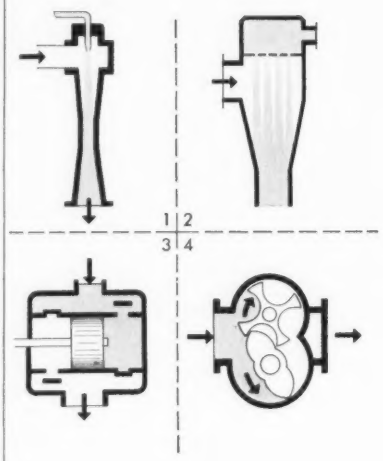

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Frequently combinations of the above are used to obtain the most suitable vacuum installation for a specific application. If you have a vacuum problem, it will pay you to get in touch with your nearest I-R engineer so that he can work with you in engineering the most suitable installation for your requirements.

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To bring frozen foods to the table at the peak of their flavor and freshness, actual zero temperature (or less) is *always* needed at every step along the way. Through packing, storage, shipment and in the store freezer, you need the reliable protection of modern refrigeration equipment . . . and dependable "Genetron" fluorinated hydrocarbon refrigerants.

"Genetron" Super-Dry Refrigerants are in use as original and replacement charge in all types of modern refrigeration systems for frozen foods. Leading equipment manufacturers, refrigeration engineers, servicemen and contractors approve and recommend "Genetron"—the super-dry refrigerants with rigorous quality specifications that are consistently exceeded in production.

"Genetron" refrigerants are available from refrigeration and air-conditioning wholesalers from coast to coast. See your wholesaler. Use the best—insist on "Genetron" Super-Dry Refrigerants.

Quick Facts on "Genetron" Super-Dry Refrigerants

- Guaranteed exceptionally low moisture content
- Noncorrosive to standard equipment materials, nontoxic, nonflammable, stable, safe
- Critical and freezing points well outside range of operating uses
- Solvent action on oil helps prevent solidification or congealing of lubricant; aids in lubrication of equipment; generally miscible with oil
- Freely interchangeable and may be mixed in any proportions with comparable fluorinated hydrocarbons meeting the same strict refrigerant specifications

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genetron 22 GREEN LABEL $CHClF_2$ MONOCHLORODIFLUOROMETHANE
genetron 113 PURPLE LABEL $C_2Cl_3F_3$ TRICHLOROTRIFLUOROETHANE
genetron 114a BLUE LABEL $C_2Cl_2F_4$ DICHLOROTETRAFLUOROETHANE

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Today's Packages Still Feature "Old-Fashioned" Motif

Despite steady advances in processing, package materials, and convenience foods, "old-fashioned" quality is still the image goal of many of today's new products, if designs like those above are a valid indication.

Invariably, the background motif here is an old-fashioned kitchen or dining room, inspiring terms such as "traditional," "memorable," and "Early American."

Seabrook Farms products, said designers Lippincott & Margulies, first created an image linked to the concept of the "American heritage," then a colonial scene was used to capitalize on this belief. Although Seabrook has just redesigned the face of its frozen vegetable and entree packages to emphasize realistic color schemes and the "Miracle Pack," a traditional setting is still maintained on the reverse side.

For its new Dessert Brownies, Arnold Bakers has expanded its traditional "brick oven" scene in light blue tones, which contrast with the brown color.

And Armour & Co. is now seeking a warm, old-fashioned image with both design and brand name for its new Hasty Hearth line of boil-in-bag, high-protein dinners. Designers combine an appealing home setting with realistic in-use product illustrations.

Object of this trend? To create consumer buying confidence by associating a product with the Early American feeling of solidity and quality.

Introduce Reclosable Sugar Package

Standout feature of the redesigned White Satin sugar package (left) is an easy-open, easy-close top.

Tongue-in-slot flap, which opens and folds-closed quickly and neatly, was developed for Amalgamated Sugar Co., Ogden, Utah, by Container Corp.

Major label change for the new, slimmer carton is a "Magic Sugar Bowl" design, printed in bright blue.

Parts of label are also color-keyed to types of sugar—brown for all-purpose, blue for powdered, green for cube, pink for superfine, and red for fine granulated.

Circle 402 on Reader Service Card

Market Tunafish "Hot Dogs"

First retail item from Tuna Products Corp., Boston, is a 10-oz. package of Ocean Fare Tunalinks.

The pre-cooked and frozen "hot dogs" are made entirely of tunafish, but are processed and flavored to taste like meat frankfurters.

Carton, containing seven large links, retails at approximately 55¢. Printed wax overwrap is a striking white, blue, and red, illustrating a plate of the hickory-smoked, fully-cooked "frankfurters."

Retail introduction will be made primarily through large chain stores.

Get Together for Marketing Drive

A cooperative brand program, designed to complement member marketing efforts, has been inaugurated by the National Milk Producers Federation, Washington, D. C.

A Dairy Charm trademark will be used on all packages, but local brand names will be retained to hold and strengthen local member identity. Federation comprises local and regional cooperative groups.

Attractive family designs have been created for the program's packages, featuring checkerboard backgrounds of various colors for flavor identification. Butter cartons and sandwich wrappers will have a constant yellow background.

Two More for Junket

Two new items, Banana Rennet-Custard and Cherry-Plum Danish Dessert, have been added to the Junket-brand line of Salada-Shirriff-Horsey, Inc., Woburn, Mass.

Banana is the first new custard flavor introduced in 6 yr. Total number of flavors is now eight.

Cherry Plum is firm's third Danish Dessert, which needs only addition of water for serving. Other flavors in this line are Strawberry and Currant-Raspberry.

New custard is packaged in regular 1¼-oz. Junket carton, which serves 4-5. Danish dessert product is offered in 4¾-oz. packages, featuring illustrations of bright red cherries.

Designed for Recognition

A new packaging program, featuring a colorful "grocery store awning" design, has been adopted by the Bernard S. Pincus Co., Philadelphia, for its complete line of Yankee Maid meat products.

Basic theme is a red and blue vertically striped awning, reminiscent of the type used by groceries and markets. Maximum white space is employed for a fresh, modern appearance.

Firm's "Brand in Demand" slogan is retained to hold recognition of line, which includes sausage products, dried beef, smoked butts, and sliced bacon.

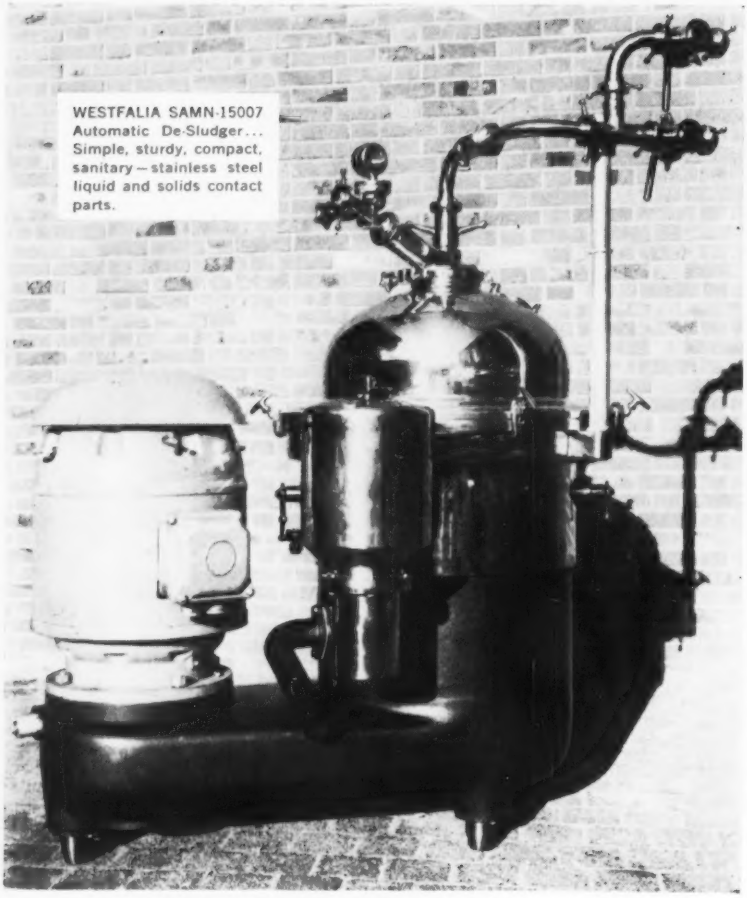
More Protein for Baby

Latest product line designed to fill the consumer's desire for improved nutrition are three high-protein meat dinners from Beech-Nut Baby Foods.

The chicken, lamb, and beef varieties, available in strained and junior form, average 31% more food value and 24% more total protein than comparable baby dinners, according to Beech-Nut officials.

Line is expected to be a powerful stimulus to baby food sales. And higher profits are expected.

Nutrition boost is provided by combining richest sources of animal protein—meat, milk, and eggs.



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Simplest Design – controls easy to reach...easiest to assemble and disassemble, no clutch or gears...
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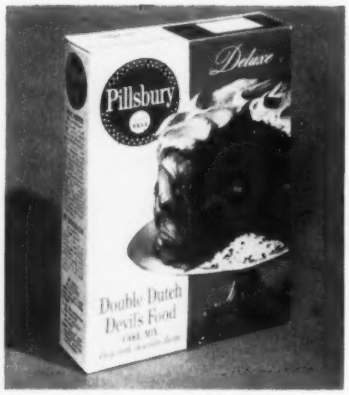


GENUINE HOLLAND COCOA is used for this new Double Dutch Devil's Food cake mix from Pillsbury Co., No. 7 in DeLuxe line.

New Product Shorts

Chocolate Covered Almonds item is newest candy from Hershey Chocolate Corp.

Hawaiian Pineapple Angel Food and Chocolate-Orange Marble have been added to General Foods' Swans Down cake mix line.

Fish 'N Chips Dinner is being marketed by Morton Frozen Foods.

To Fruit Juice line at Clapp's Baby Foods have been added 4½-oz. cans of orange, apple and apricot, straight apple, orange-pineapple, pineapple-grapefruit, and apple with pineapple.

Perishable 1½-lb. canned hams from Armour & Co. are beating fully sterile, non-perishable ham miniatures to sales punch, say officials. Superior quality is cited as factor.

Decaffeinated Instant Coffee is on the market from Rich-Taste Corp., Long Island City, N. Y.

Junior Spaghetti With Beef, strained Bananas With Pineapple, and both strained and junior Ham With Vegetables & Cereal are in distribution from Gerber Products Co.

Reddi-Maid-Cherry Sauce, product of Cherry Growers, Inc., is now being marketed in Great Lakes area. National distribution is to follow.

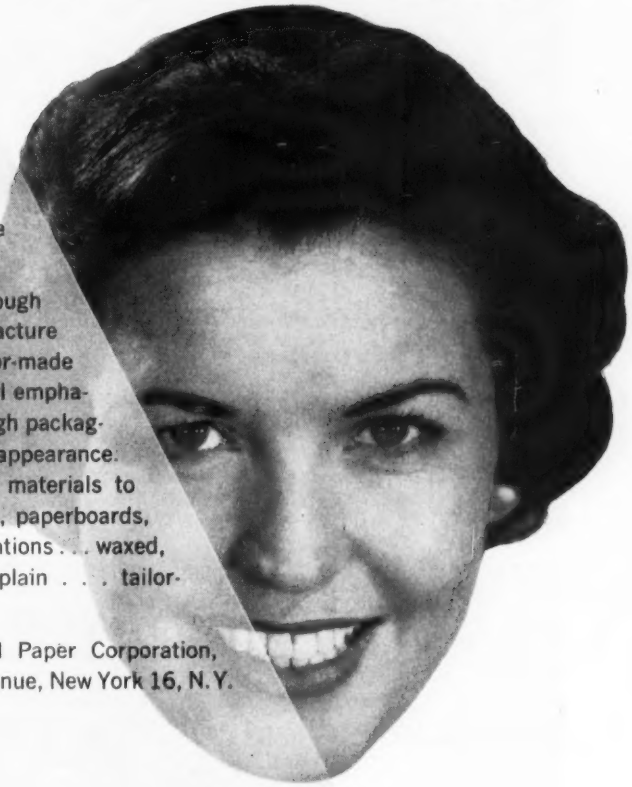
Packaging Briefs

Metal lids for dairy products are offered in three sizes by American Can's Dixie Cup Div. Opaque and translucent polystyrene lids are available for meats and other high-moisture items. (403)

Polypropylene film, a versatile, high-performance plastic, has been introduced by Chippewa Plastics Co. (404)

Fluorine-containing thermoplastic resin, entry from Pennsalt Chemicals Corp., has high heat and corrosion resistance, and is easily fabricated. (405)

Just Between You and Your Customer



Customer loyalty is your most valuable business asset. One of the custodians of this loyalty is your package, and the product protection it provides.

Here's where Riegel can help, through research, development and manufacture of packaging materials . . . tailor-made for your product . . . with equal emphasis on protection, low cost, high packaging speed and attractive appearance. More than 600 different materials to choose from . . . papers, paperboards, foils, films and combinations . . . waxed, coated, printed and plain . . . tailor-made or standard.

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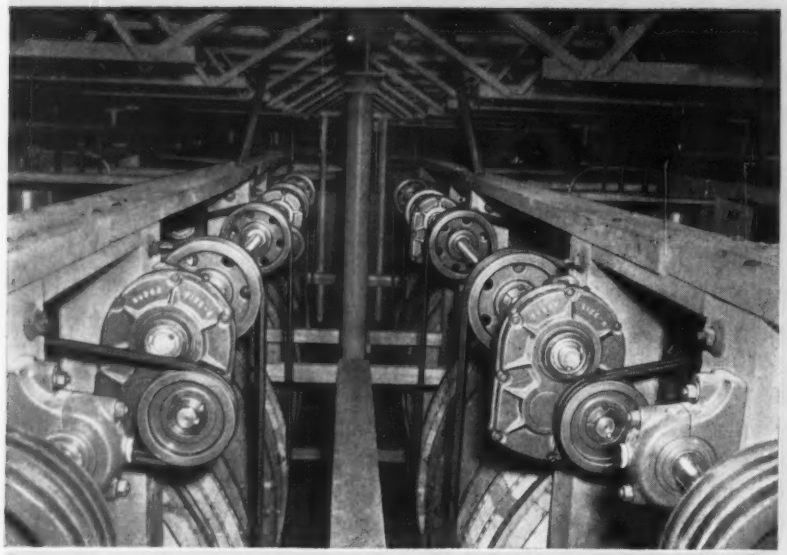
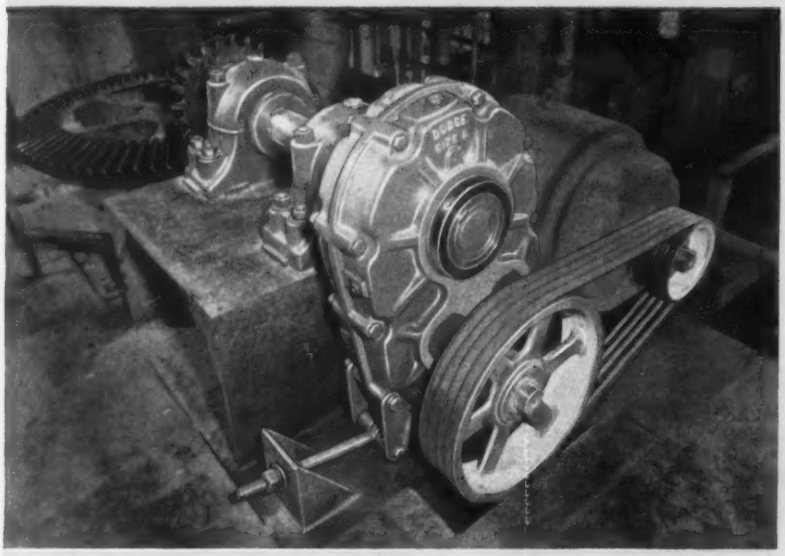
PROTECTIVE PACKAGING MATERIALS



DODGE TORQUE-ARM SHAFT MOUNTED SPEED REDUCER

Install it anywhere—with minimum time and effort. Here is an overhead installation on tanning drums. Torque-Arm reducers are resistant to acid fumes, salt water environment, moisture.



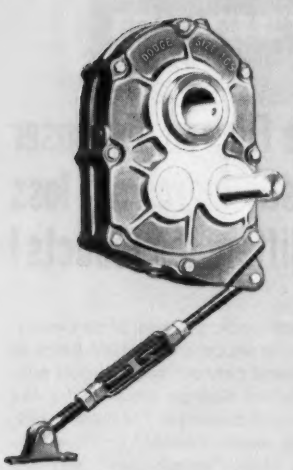
DODGE TORQUE-ARM SHAFT MOUNTED SPEED REDUCER

Can be positioned any place on the entire length of the shaft. It locks into place on *both* sides of the housing. Note modified torque arm on this installation on a mixer in a beverage plant.

The Speed Reducer Idea that

Two things account for the record popularity of Dodge Torque-Arm Speed Reducers. First, they cost less to install since they require no foundations, sliding motor rails or flexible couplings. Second—and most important—these modern reducers as developed by Dodge perform *brilliantly*. Tens of thousands of installations underscore Torque-Arm dependability. Torque-Arm is America's *quality* shaft mounted speed reducer!

Torque-Arm has been so extensively adopted by industry that today models are available for a vast range of applications. The Torque-Arm line offers you capacities up to 170 hp—output speeds from 10 to 400 rpm—in single and double reduction series—with 5 to 1, 15 to 1 and 25 to 1 ratios. Models for vertical or inclined shaft operation are available—as well as special-application versions such as flange mounted, right

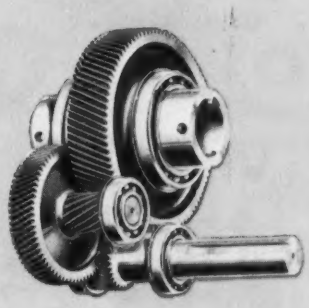


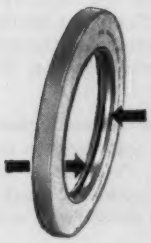
Rugged semisteel housing— a solid backbone for solid service

Here is a tough, corrosion-resistant housing with the strength to hold bearing seats in line for the life of the unit. Perfect shaft and gear alignment are assured by doweling the matched halves together and boring in line. No gear is overhung. Loads are carried easily, contributing to Torque-Arm's long life and high efficiency—97% in double reduction models, almost 99% in single!

AGMA rated gears— quality-guarded by continual tests

These helical gears have soft cores to withstand shock—and hardened surfaces to resist wear. Their quality is guarded in manufacture and assembly by the most modern methods of quality control, including inspection for runout, tooth spacing, helical lead and involute profile. They run quietly, mesh precisely. Teeth are crown shaved for maximum contact area. Gears are shrunk on their shafts to prevent shifting.





Modern double-lip seals keep oil in and dirt out

Modern synthetic, double-lip seals of the highest quality keep oil in and dirt out of the reducer case. These seals offer protection for the unit from dust and dirt and just as effectively insure cleanliness when operating in laundries, textile mills, food processing plants.

Re-ally Clicked!

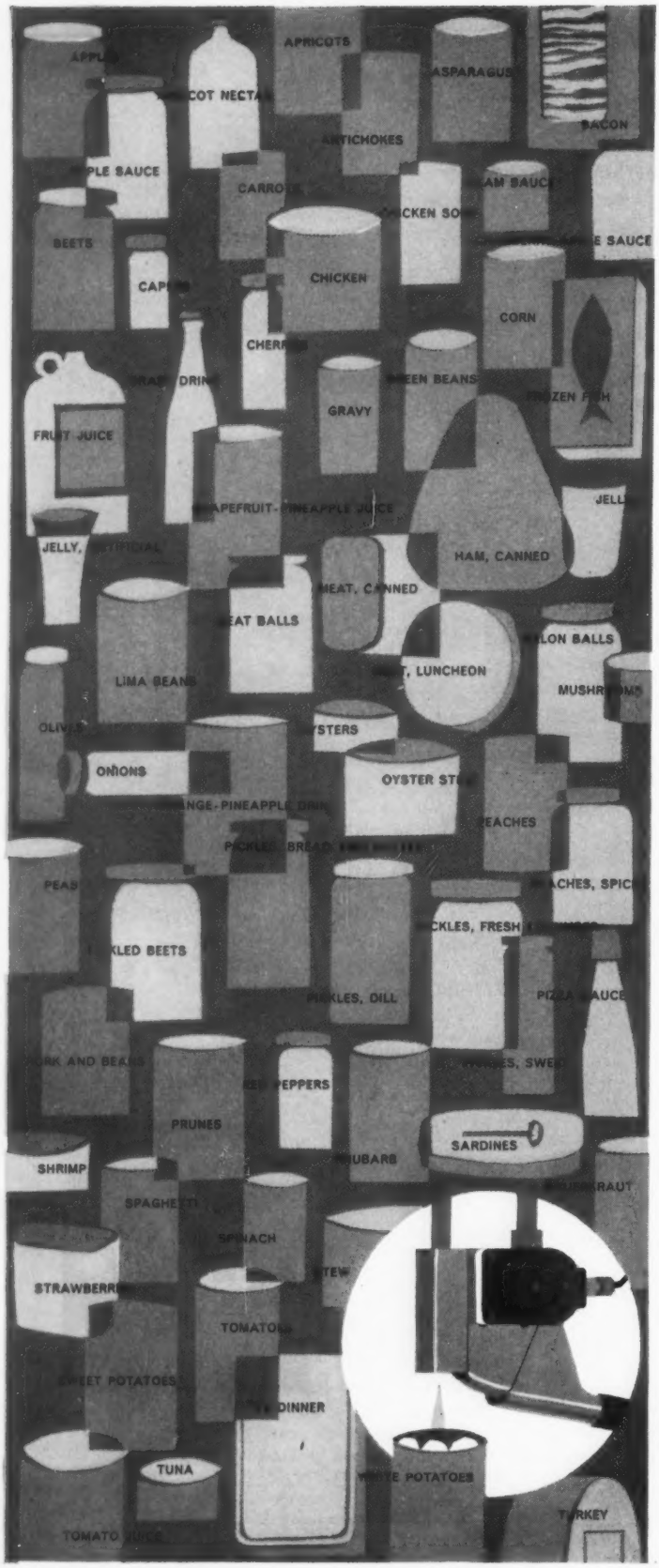
angle and extended input shaft styles. Optional equipment includes a positive, sealed-in backstop and a positive overload release.

Ask your local Dodge Distributor. Or write us for our 64-page Torque-Arm Speed Reducer Bulletin, complete with engineering data and easy selection tables.

DODGE MANUFACTURING CORPORATION
2800 Union Street • Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."



No splash...
No spill...
No overfill!

Versatile Flocron dispenser ends costly ingredient loss for 63 different products!

Companies who pack, process or can everything from apple sauce and pickled beets to chicken soup and canned meats report substantial ingredient savings since using the new Flocron liquid dispenser. For the amazing Flocron avoids waste inherent in "overflow fill" systems, stops "splash loss" and dispenses more than forty different ingredients with speed and pin-point accuracy that saves money.

The versatile Flocron is actually a precise electronic system with photoelectric circuits in a sealed unit and a new lever-type photo switch to activate dispensing. It assures accuracy, even on lines handling up to 300 units per minute! Remote electronic controls permit you to "dial" the exact amount of liquid required for varying can sizes.

Designed for efficient, low cost operation. The Flocron is made of stainless steel and plastic and is constructed to avoid corrosion and lengthy breakdowns that result in costly downtime. There are no valves to stick or clog, and the Flocron is easily cleaned by circulating a detergent solution through the fluid system and following this operation with a sanitizer.

No need to revise production lines. The Flocron can be operated with existing equipment. Scientific Dispensing Company technicians are available in all areas to assist with installation and service problems.

Some of the liquids you can dispense with the Flocron include: ascorbic acid, beef gravy, brine, concentrated syrup, hot butter, Monosodium Glutamate, spice oils, sugar and brine, tomato puree and vinegar.

For a complete list of ingredients the Flocron dispenses and for additional information about the Flocron itself write:

Scientific Dispensing Company
Division of

MORTON SALT COMPANY

INDUSTRIAL DIVISION

Dept. FE 4,
110 North Wacker Drive, Chicago 6, Illinois

"The Poisons in Your Food"

Our industry cannot let go unchallenged the grossly unrealistic, biased, and unfair allegations that pack the 277 pages of the book whose title is the heading for this editorial.

Because it must be answered, we publish a pointed commentary on the bias of the book (page 42). But we would have to quote page after page *ad nauseum* to give you the full, concentrated dose.

Food company executives and technologists should read this work in its entirety to inform themselves of the charges made against their principles and purposes, and against the safety and quality of their products.

They should do this that they may answer the allegations. Neither consumers, their self-appointed spokesmen, legislators, nor non-technical writers know enough about food additives and about the industry to see the book in its true light. So people in the industry must be ready to answer their questions, defog their confusion, and give antidotes for the poison that inevitably will be created in the minds of uninformed readers of the book.

Even your employees may be misled

Remember, too, that your own employees could be misled to question the safety and value of the products they help to produce and package. This would impair their morale. And your goodwill in the community would be kicked in the teeth if your own workers accept, or permit their friends to accept, the awful allegations of the author.

A journalist by profession, the author throws a mean poison dart. In his opening paragraph he refers to succulent apples bought for the children's lunch, then asks:

"But did you suspect that they were probably shot through from peel to core with some of the most powerful poisons known?"

Raging rampant from there to his "What To Do About It" finale, the author puts deadly poisons into practically every type of food—processed and fresh. And in so doing he discredits the good health of the nation, the good practices of food companies and their technologists, the capable FDA, and the strong pure food law.

He interweaves scientific data and opinion with implications and interpretations to fabricate conclusions that slant in the direction of his pen. He pontificates on science without the training or the caution of the scientist.

Read 'em and laugh; others may not

Let's take a few samples:

"Congress legalized the mass poisoning of the American people by granting the FDA the right to determine how much poison may remain on a marketed food."

"How many people are dying now or will die in the future because our food laws are designed to protect commercial interests first, people afterward?"

And about the food technologist: After naming a list of chemicals and alleging some to be in "virtually every bite of food you eat," the author says:

"These are the tools of the food technician—a wizard who can beguile, deceive, and defraud the housewife by making her think she is getting something that she isn't."

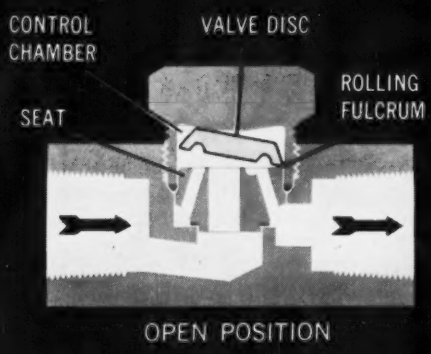
The author is even against the purest of foods, saying that "White sugar represents another victim of the food refiner's black art."

These statements—and hundreds of others in the book—will give food technologists a hearty laugh.

Unfortunately, the fact that the work is ridiculous in the eyes of the informed does not keep it from misleading food consumers.

So it is time to educate the public about additives, as Commissioner Larrick points out on page 43.

Do your steam traps give you these 3 advantages?



1. Economy of operation on light loads?

The Yarway No. 30 gives you closer control—discharges condensate at full capacity, closes immediately on steam.

2. Longer service life?

Yarway's lever action reduces impact on valve seat—lessens wear, gives longer operating life. Quieter operation, too!

3. Lower maintenance?

Only Yarway offers an Impulse trap with renewable seat and disc that *can be replaced without removing the trap from the line.*

Why settle for less? Get all three money-saving advantages with Yarway No. 30—plus these time-proven advantages of all Yarway Impulse traps: quick heat-up, even temperatures, small size, stainless steel construction, non-freezing.

Nearly 1,300,000 Yarway Impulse traps already installed. Stocked and sold by 270 Industrial Distributors. Ask *your* distributor to arrange a free 90-day trial in your plant. Or write us.

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A MARK OF QUALITY IN STEAM ENGINEERING

CIRCLE 77 ON READER SERVICE CARD→

The alternate to this is . . . DOWNTIME!

An ounce of prevention . . . can eliminate *downtime* in your plant. With today's highly mechanized manufacturing and distribution methods . . . *downtime* of materials handling equipment can mean the difference between a profit or a loss.

A Clark Dealer *Continuous* Maintenance Program, available from 113 Clark dealers across the continent, offers you the most effective, and economical method of reducing costly *downtime*. Here's why!

In brief, a Clark Dealer Continuous Maintenance Program offers you:

1) . . . regular maintenance on your industrial trucks on a *programmed* basis. Scheduling is conveniently set up for your particular operation. If you like, service to your equipment can be done at night or at any other time when your equipment is not in use. The additional cost for this off-shift service is a small percentage of the cost of *downtime*.

2) Clark dealers, with the aid of a national service personnel training program, assure you that the best trained mechanics in the industry will service your equipment. These highly trained specialists perform a minimum of 22 separate inspections on every truck serviced. They not only perform the normal jobs of greasing and oil changes, but also make all necessary adjustments to your equipment. Most important, they report the condition of your machines, anticipating failure before it happens. As a result . . . *downtime* is drastically reduced.

3) A Clark Dealer Continuous Maintenance Program gets you out of the repair and maintenance business. It eliminates the need for special tools, parts stock and use of valuable plant space for servicing facilities.

4) A Clark Dealer Continuous Maintenance Program is economical. It actually costs less than similar service on your own automobile. This is an inadequate comparison, however, when you consider the small cost of preventive type maintenance to the cost of *downtime*.

For detailed information on a Clark C.M. program call your local Clark dealer (he's listed in the Yellow pages) or write: C.M. Service, Clark Equipment Company, Battle Creek, Michigan. No obligation, of course.

CLARK® EQUIPMENT

Printed in U. S. A.

D&O proudly presents THE PERFECT SEASONING . . . the most scientific approach to seasonings, developed at the D&O Dry Materials Division.

PREMIUM QUALITY:

SPISOSEALS

SPISOSEALS are a line of powdered spice flavors based on spray dried oils and oleoresins, precisely formulated for use as alternates for crude spices, essential oils and oleoresins, solubilized oils, and dry solubles. There is no form of seasoning with finer, more well rounded flavor, nor any with such ease of handling.

SPISOSEALS: guaranteed flavor control and instant flavor release. Unsurpassable shelf life: these "locked-in" seasonings by virtue of the impermeability of their structure (tiny globules of oil secured each in its own individual casing) are protected against ravages of time, spoilage, volatilization.

SPISOSEALS: water soluble; completely and uniformly dispersible, both in dry products and in aqueous liquids where emulsion qualities set up a colloidal suspension system assuring permanent dispersion.

SPISOSEALS: stable, will not dry off — proved by analysis. Free from contamination, will never speck or discolor product.

SPISOSEALS may be custom formulated to replace any blend of spice flavors you are now using . . . We invite processors of quality food products to sample this new line of premium quality seasonings. Send your request to D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N. J.

Write for copy of SPISOSEALS brochure

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FLAVOR BASES • ESSENTIAL OILS
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Sales Offices in Principal Cities OUR 161st YEAR OF SERVICE

PRICE PLAYS CAN BE MURDER when product goes off the economic track. Accenting sad story are many markets where fowl have run afoul of pricing battles—as Germain's Food Store, Brooklyn (left), which slashed tags to 10c a lb. (UPI photo)

FOOD ENGINEERING

Poultry Dilemma Teaches Object Lessons in Business

Field is in throes of cost-profit rupture, as over-production pulls one way, price cutting the other. Solution, leaders are told, lies in new sales approaches, improved marketing techniques, creation and merchandising of new products that fulfill consumer's—not company's—wants

WITH RAZOR-SHARP speakers zeroing in on the poultry field's tough profit-on-volume-alone problems, and with grim-faced leaders 'tossing the ball' in open discussion, this gathering resembled a hot college graduate session on business methods.

Scene was Kansas City's Municipal Auditorium during the Annual Poultry Fact Finding Conference's Design for Decision program. Specific aim was a careful distilling of the what-to, why-to, and how-to—to help the field fight its way out of a gigantic economic squeeze play in its battle for a bigger share of the $70-billion food market.

Calls for Creative Selling

The lead-off speaker, Harold Williams, president of the Institute of American Poultry Industries, told members that creative selling is the only way out of their frustrating dilemma.

"Caught between rising costs and lower prices, many operators," he said, "have thought volume was the only answer." But, he declared, without creative selling, increased volume cuts prices more than it cuts costs.

And this dependence on profit-on-volume-alone means heading for more trouble.

"Look in your ledgers," he prodded them. "See how much you've invested in new equipment for more efficient operations. But how much money—or time—have you invested to sell more effectively?"

"What," he needled them, "makes you think you can 'get away' without investing money to develop your sales organizaton, to improve your selling techniques, to create and merchandise new products?"

Price alone, he further challenged, won't keep eggs on the breakfast table or poultry on the dinner table. Processors of other foods sell their products with new marketing concepts. So poultrymen must compete with them—not only with their prices but with their ideas.

"Today," he said, "you don't expect to operate efficiently unless you're properly equipped. So how can you expect to sell effectively unless you're equipped with men having managerial talent instead of only technical skill?"

He then listed these three requirements for such men:

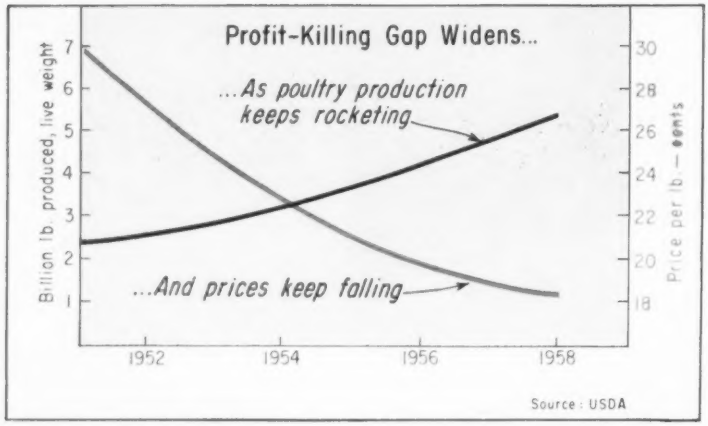
1. **Scientific alertness**—to spot coming changes and adjust to them.
2. **Intellectual capability**—to develop and deal in managerial principles and marketing ideas, instead of simply operating on price.
3. **Moral courage**—to think and act differently when judgment indicates it's necessary.

"Using more vision," he concluded, "you can apply the same ingenuity and imagination that have been applied to production. Then you'll come out of the squeeze play Okay."

Focus On Consumer

Point accented by Robert T. Browne, director of marketing development, The Pillsbury Co., was that the consumer—not the corporation—has become the center of business.

(*Continued on next page*)



TWO-WAY STRAIN of excessive output and slashed pricing heads poultrymen ever nearer to economic reefs. Field's off-course difficulties pack a warning to other food sectors where drives for volume may entrap firms in similar cost-profit squeezes.

Companies don't make the final decision. The consumer does.

"Today," he said, "we see attention switching from production to sales problems–from products now made to those that customers like best and will buy. There's a swing from the company itself to the market place relative to kind of goods produced or that can be produced.

"Under today's economics, the consumer has few–if any–'needs.' But he has many latent desires. Many products on the market readily can be substituted for others. So 'need,' in its truest sense, has largely been eliminated. It's been replaced by 'desires'–which can be stimulated by other companies who, with technical know-how and equal wisdom in marketing research, proceed to determine latent desires and fashion products accordingly."

Browne then told field leaders they mustn't become muscle-bound on public service. He cautioned that without sharp focus on what the consumer likes and will buy–rather than on what they, the companies' want to produce–the plaguing problems will continue, and grow worse.

"Concern for the consumer of your product," he said, "must start with top management and then radiate to the personnel involved in all the functions–production, research, procurement, accounting."

Distinction of Product

At this point, leaders sat pat, waiting to hear more. And next, P. D. Martineau, director of research and marketing for the *Chicago Tribune*, suggested a way out of price competition:

"Key to growth," he declared, "is to create in the consumer's mind the idea that your brand is something special and different."

He cited companies employing advertising, packaging, and other promotional devices, to distinguish their products from competing brands–even though there was little technical difference.

"The financial reports," he then told them, "show that these companies have a higher profit ratio than those simply selling a good product at a competitive price."

He continued: "Rightfully proud of production achievements, you should now be more involved in selling than in just producing a product. Value of a product depends on how desirable it is and on how much people want it. So anything you do to make your brand seem more desirable will increase its value."

"Any benefits from price cutting," he said, "are usually only temporary. Customers may be switched back and forth. Generally, everybody winds up with the same share of the market as before–and with less profit.

"Price cutting isn't imaginative selling or resourceful marketing. And it isn't the only recourse. Another move is to create distinctions for your brand, apart from price, in the buyer's mind.

"Because most meat packers have failed to create such distinctions, pricing of their products is almost entirely in the hands of grocery chains."

Martineau concluded by stating his belief that management is inclined to think too much about product and price and too little about the buyer and why she buys.

Shape to Buyer and Retailer

In a following talk, Ray Bailey, manager of food marketing, *This Week*, told members that today's stream of new products will look like a meandering brook compared to the flood of them later in the '60s.

"Historically," he said, "new products primarily were planned to fill a company's needs rather than consumer's wants. In contrast, today's marketing leaders start their thinking with the consumer." Accordingly, he predicted that companies planning consumer-benefit products will forge ahead of competitors.

"Next to importance of the consumer," continued this speaker, "is the burgeoning power of the retailer. To give your new product a good kick-off, it's vital to work closely with the retailer to avoid the formidable roadblocks that cause disastrous delays."

Pitfalls of Controls

Poultrymen who want an expanding and prosperous future–and freedom to operate–were advised not to ask government bodies to solve their price problems. "Alternative to growing dependence on government," suggested Earl Butz, dean of agriculture at Purdue University, and formerly Assistant Secretary of Agriculture, "is realistic pricing and effective merchandising."

He warned of a saddling with a growing maze of controls as the price paid for government help. "Price guarantees," he declared, "ultimately force restrictions that severely limit rights to produce and to market."

Continuing, Butz said he doubted that a marketing order for poultry and eggs would accomplish much price-wise. He saw such an order–to reduce supplies by regulating quality–having only a limited effect because present poultry quality is generally high and that of eggs is rapidly improving.

As for a cooperative move by firms in the field to curtail production, he didn't see such a program doing much to raise the price of poultry and eggs so long as red meats and other proteins were free to move into markets to replace them.

Thus he concluded that if production controls were imposed–either administered by poultrymen or enforced by government–it would be doubtful that the poultrymen could look forward to any growth in the next several years.—*FE Staff*

Zero Code Chills Packers

Requiring 0F. handling on frozens from plant to home puts critical strain on equipment and manpower, NAFFP meet hears

FROZEN FOOD FIRMS, who seem to thrive on crises, are bracing themselves for what could be their biggest challenge to date.

Cause of this latest tempest is a code–drawn up by the powerful Assn. of Food & Drug Officials of the U. S.–calling for enforcing zero temperature on frozen foods through all stages of the distribution cycle–from packing plant to shopping basket.

In the works since '55, the code got a full airing last month at the Chicago convention of the National Assn. of Frozen Food Packers. And like the man who is for virtue so long as it isn't legalized, spokesmen OK'd the code as a model for operating behavior–but opposed its being given legal teeth.

What disturbs most frozen food factors is the hefty dollar outlay necessary to upgrade equipment to make it conform with the zero provision. For example, Cyrus B. Weller, Refrigerated Food Express, estimates that motor carriers would have to invest $150 million in over-the-road stock–a task that's complicated, he says, by the fact that such vehicles are used only 25% of the time. And a Pacific Intermountain Express spokesman feels it would take 5 yr. to carry out the retooling.

Educating handlers to comply is another expensive proposition, speakers at the NAFFP meeting warned. Retailer Doyal Lank, Marsh Food Liners, pointed out that upgrading "clerks who stock cabinets and see that they operate properly" is a terrific problem because of constant turnover.

Looking to the future, freezer people are seriously concerned by two potential booby-traps stemming from the code. For one thing, while AFDOUS considers its model to be an "informative guide" for states planning formal frozen food regulations, there's nothing to prevent the states from adding their own touches.

In fact, Massachusetts, first to adopt the code, did just that when it tacked on bacteriological provisions that set up maximum standard plate and coliform counts for frozens. The state law, which goes into effect Aug. 1, is considered "unrealistic" by freezers.

At least one observer feels that the Massachusetts example shows that "while food and drug officials may 'recommend,' it's the politicians who write the laws." Despite AFDOUS' declared aim to bring about rule uniformity, it is his view that what happened in Boston suggests that freezers may still end up wrestling with 50 different sets of laws.

New Flemming-Type Fiasco?

A second source of concern is that loose wording in state laws would bring about the same kind of mess that's developed around the food additives amendment–with additional laws needed to spell out what was meant in the first place. Also, some feel that once other states join the parade, hastily drawn laws may cover a lot more than frozens–such as refrigerated foods or perishable items.

And disturbing many is the possible loss of public confidence that could result from local impounding of frozen food lots that are 4 or 5 deg. above zero–"illegal" but not necessarily harmful to product quality. Since freezers still have to convince some two-thirds of family buyers to become steady users of frozens, they fear that a spate of seizures would undo years of educational efforts.

A frequent question that cropped up at the NAFFP session was: Who is responsible for seeing to it that the zero maximum is enforced? Weller put it thusly: "Two or three hours of loading or unloading during which a product can't be protected provides a fuzzy area of responsibility. When does the trucker become responsible?"

The kind of ticklish situation that's bound to crop up more often was described by James J. Gallery, Quincy Market Cold Storage. "If the trucker delivers a load to us at 10F," he stressed, "we may respect his integrity and his problem–but we can't sign for it as arriving at zero."

And Joseph Gaudio, Philadelphia distributor, pointedly warned that "to protect ourselves, we'll have to buy on the basis of f.o.b. delivery at our plant. Since very few shipments arrive at zero, it's safe to predict that there will be lots of inventory back on the hands of the carriers."

Pasco's R. Frank Dickinson said the code means "zero has to begin at the packing plant, since transportation equipment now in use can only maintain product temperature, not lower it." But Sunkist's Tom Borden went him one better, declaring that packers would have to keep products at −5 to −10F. to allow for the temperature rise that occurs during normal handling. *End*

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

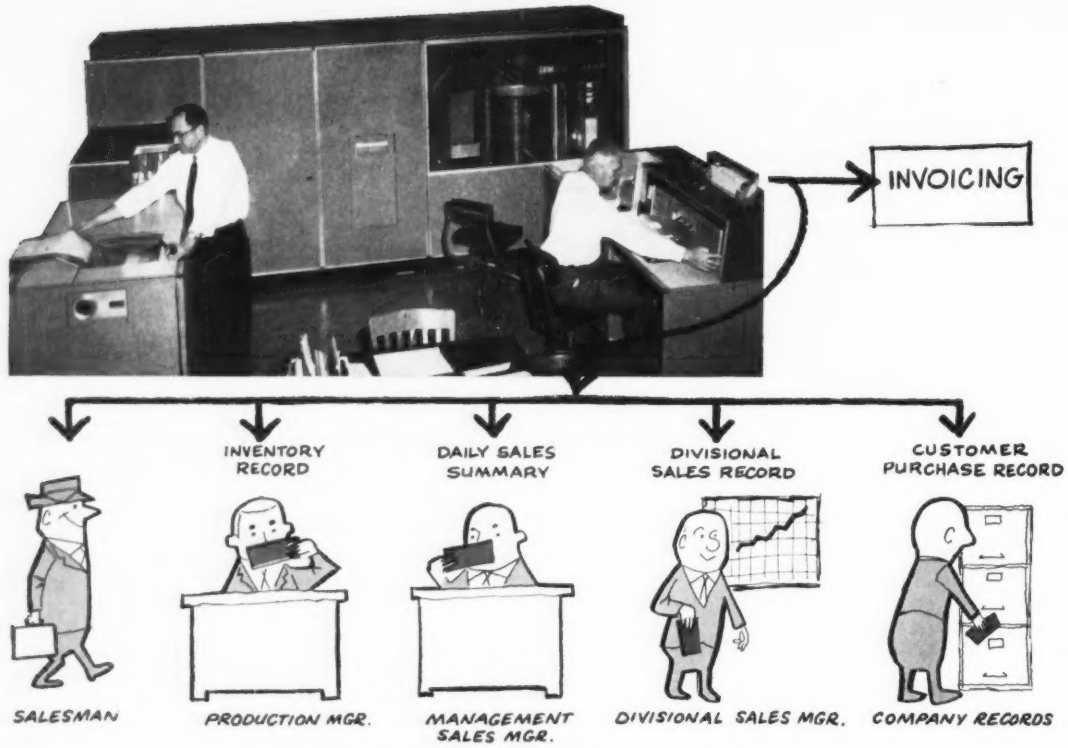
—But Sales Outlook Is Still Rosy

Despite concern over the AFDOUS code, the NAFFP meet had the usual quota of "good times ahead" forecasts. With sales up another 12% last year—to $2.7-billion—leaders see volume topping $7-billion by the end of the decade. Sparking this upsurge:

▶ **Favorable population trends.** Philip M. Hauser, Chicago U., said that the baby boom back in the '40s means a family-formation uptrend in the '60s. Also, that half of the 80-million-plus working force expected around '65 will be women, who will rely on convenience-type foods as they split their time between job and home.

▶ **Revolutionary in-store developments.** These include (1) tiered freezer cabinets, enabling retailers to take advantage of "air space" and stock wider varieties of frozens, and (2) electronic ovens to heat frozen prepared meals—"they'll do for frozens what the rotisserie did for chicken and ribs," said Red Owl Stores' William J. Quinn.

▶ **Upsurge in institutional sales.** Paul Shufflebarger, Chicago distributor, predicted that eating out, which accounts for one out of four food-beverage dollars today, will hike its share to 33% in a few years.



System Speeds Data All Along the Line

Action view of Ramac at R. T. French shows compact working-"U" setup. As Herbert Booth pushbuttons infeed operations at control panel (right), Technical Expert Roger Greene checks invoices coming off printing outlet. Note metal memory disks in unit cabinet (rear). They pack data in millions of magnetic spots.

'Brain' Gives Jump on Business

Flashing out working figures weeks ahead, robot memory-calculator puts vital new punch in R. T. French operation. All facts are at finger tips as lightning runs of invoices, inventories and sales summaries skip old paperwork

ELECTRONIC "BRAINS" aren't distance blue-sky units for food men—as many an operator might still think.

▶ You needn't go any farther than Rochester, N. Y., to see that the robot figurer is already in solid on the job of speeding prime data for the up-front processor.

There, about a year ago, The R. T. French Co., maker of mustards, spices, and many other food lines, began operating a new electronic "brain"—among the first to be installed by an American business firm.

Granted, no precise balance sheet can yet be drawn. But this installation has most definitely chalked up substantial benefits, both tangible and intangible.

Management now gets clearer, more up-to-date pictures of the company's national operations. The state of day-to-day business is gaged more quickly, more accurately. In short, the "brain" is promoting both efficiency and growth of the company.

True, there is still some distance to go.

The food company has been running its robot at only about half capacity over some 15 hr. a day. But with more experience, its use will be accelerated.

This all takes time. The unit is both flexible and complex, and careful study is involved in "groundworking" it for the most profitable analysis and accounting. Amazing as such calculators are, there must be prior charting of the right courses for them to follow. Ultimately, as operations are speeded and skills accumulated, French hopes to get its

DESMOND STONE

Special FE Correspondent, Rochester, N. Y.

machine working at 100% capacity over the 15-hr. period.

The company chose two of its staff to learn the intricacies of its Ramac unit before it was installed. These men—Herbert Booth, with the company 30 yr., and Roger Greene, technical expert—today control the daily programming and operation.

Here's How

As this is written, French is applying the machine in three major related fields—invoicing, inventories, and sales summaries. For a look at the action, let's consider what happens when, say, 4 doz. tins of allspice are charged to a customer:

First, all the relevant information is punched on cards by women operators. Then these cards are verified and fed, one at a time, into Ramac.

When the allspice data go in, the item is printed on eight invoice copies at the machine's printing outlet. The unit automatically multiplies the price of 1 doz. tins to arrive at the cost of 4 doz., and it also figures out the cash discount.

Performed at the same time are 5 other actions that directly update—

1. Inventory records of floor stock at the main distributing facilities in Rochester and Souderton, Pa. And if, at this juncture, stocks of allspice have dropped below the minimum, a warning is given automatically.

2. Daily sales total of allspice.

3. Monthly sales total in dollars in the affected sales district, for reports to individual salesmen.

4. Monthly sales total in quantity, for reports to the various divisions (encompassing the many sales districts).

5. Customer's record, to show how much allspice he's bought over the period.

Meantime, the record is also adjusted so actual sales can be checked at any time against prior estimates of sales.

The improvements provided in these functions are: A great gain in speed, a striking saving in paperwork, and new accessibility of records.

It takes but 1¾ sec. for all these updatings to be made with each item card. And this means that the monthly dollar sales total for each item (and there are over 800) can now be sped to individual salesmen within the first two days after the month ends. This advantage is enormous. Sales reports must be prompt to be useful.

Formerly, salesmen had to wait 2 or even 3 weeks into the new month before getting this vital data. Now they have the latest word, right at the month's start, on how sales stand and how they compare with earlier performances. Thus, salesmen spot imbalances quicker and move at once to correct them.

It's the same with the customer records. Ramac immediately whisks out data on how much of any product has been sold to any customer in any of the national sales districts. Thus, the company has its finger permanently on the pulse of business and can act at once to adjust the flow.

The advantages are myriad—extending from better service on company routines all the way through to strides in better service to customers. Dollar benefits are most readily gaged relative to inventories: French estimates that it's been able to reduce running stocks by about one-fifth. This is big in anyone's language! And carrying and storage costs have dropped proportionately.

Any operator can appreciate this kind of streamlining. Depending on size of company, it can mean savings ranging on the order of $25,000 to $200,000 a year.

With the "brain" keeping daily track, the expensive risk of "running too long" on floor stock—storing excessive quantities of some items—is almost eliminated.

Already noted is the automatic warning when stock falls below minimum, thus virtually abolishing the danger of running out of stock. Here is an illustration: In August '58, before the machine was installed, French was out of stock on 21 different items on various days for varying periods. But last August it was out of stock on but 1 item and 1 day only. And it's to be noted that this was a unique item—special mustard flour made to a customer's order.

Two further fields ultimately to be tied in are packaging and raw materials. French's many hundreds of products call for enormous quantities of bottles, paper, film, packets, and the like. Applying the "brain" to control of these materials will insure against excess quantities of this or that item, or of running short of others. And the same with tighter control of raw-material stocks to avert hazards of running short or running long.

Process machine scheduling is still another sphere for the "brain," working with the different unit productive capacities. Some line machines, being very flexible, pose problems as to optimum scheduling for minimum costs. The improved programming could be aimed at reduction of short runs in order to save on costly setup expenses.

There are special benefits in letting the "brain" do your remembering. This insures against human error. Thus, the inventory manager can concentrate on the items the machine warns him about. He doesn't have to be constantly thumbing through his records to try to keep watch of the entire stock. He's freed to attend to other matters.

Just Ask the "Brain"

Almost any figuring type of operation is "fair shooting"—provided there's enough benefit to be gained by machine-programming the data. Through a "piloting" operation, the "brain" itself will tell you whether there actually is such a benefit.

An instance is French's use of the machine in complicated additions and subtractions for payrolls. In effect, it extends the pay figures and calculates the net pay. Previously, this work was done very efficiently by a calculator. But tests showed the robot unit does it just as well—and more quickly.

Efficiency and speed have grown with experience. As first applied for multiplying pay figures, performance was 22 cards a minute. Then some apt changes raised the rate to 33 and later 45 cards a minute. Just in this minor operation there's been a saving of some $20 weekly.

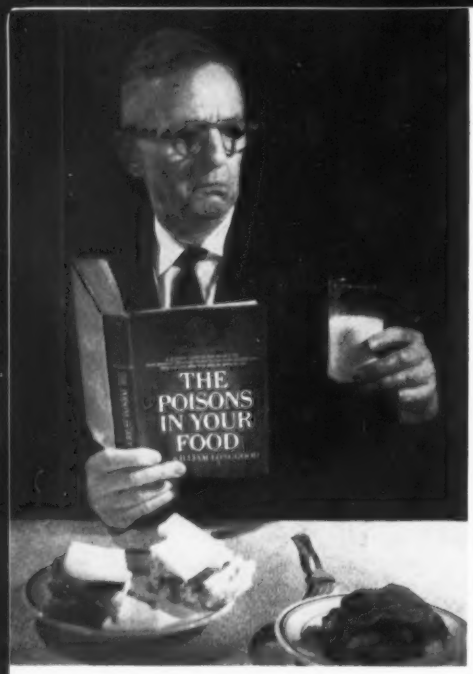
"The beauty of the 'brain'," Mr. Booth sums up, "is that you get your battle reports on any front at any given time. And the machine is quite impartial. It's as quick to tell you bad news as good news." —*End*

Specifics of French's Unit

Named Ramac in abbreviation of "Random Access Method of Accounting & Control," the IBM 305 machine employed by The R. T. French Co. is essentially an electronically operated data-processing unit.

It can store up to 5 million numerals and alphabet letters as magnetic spots on its rotating metal memory disks. In accord with selected programs, the stored information can be fed out at any time with countless intermediate calculations completed.

Each new entry automatically adjusts all the related records in storage, bringing them up to date.



Book Fans Additive

Consumers' minds may be poisoned wholesale by unfair and biased statements. Food industry cannot let it pass unchallenged

Book Review

THE POISONS IN YOUR FOOD *by William Longgood; Simon & Schuster, New York, 1960 (277 pages; price $3.95).*

ONE MIGHT EXPECT an author or publisher to show reasonable regard for the reliability of evidence and opinions that are available to any diligent writer.

This is especially important in a book dealing with an area of subject matter that is essentially scientific in nature and is obviously of great importance to the public.

Several of the foremost scientific organizations in the United States have given very active, sustained, and unbiased consideration to the problems implied by the title of the book.

Consumers Well Protected

These organizations are continuously alert to the need for efficient agricultural food production—to the related problems of food processing and distribution—and particularly to the related aspects of protecting the health of the public.

DR. CHARLES GLEN KING

Executive Director, Nutrition Foundation, Inc., New York City

One cannot overlook the competence, integrity, and intelligence of the following:

National Academy of Sciences–National Research Council, the foremost advisory scientific body to the Federal Government and to the public.

American Institute of Nutrition, foremost organization of nutrition scientists.

American Medical Assn., the largest organization of accredited physicians.

American Chemical Society and the **Institute of Food Technologists.** These two groups are the largest and most responsible organizations in their respective professional fields.

Yet, the views and publications of these organizations and their representatives are scarcely recognized in the book under review.

[Editor's note: The Nutrition Foundation, modestly not mentioned by the author, certainly belongs in this list of authoritative sources ignored by the book author.]

In addition to the above highly qualified professional societies, other highly responsible agencies have maintained a continuing interest in the problems of agriculture and public health. Among them are the Federal, state, and municipal governments. These have maintained a vigilant and, on the whole, efficient surveillance of the safety and nutritive quality of the public food supply.

The two federal departments chiefly concerned have been the Department of Agriculture and the Department of Health, Education & Welfare. With rare exceptions, such as one finds in any sphere of human endeavor, the above agencies and the agricultural, chemical, and food industries have an excellent record of integrity in meeting their responsibility to the public.

There have been specific instances of carelessness and other forms of reprehensible activity, as any one should know. But such instances have been much too exceptional to justify attempts to create a sense of rampant fear about the safety and quality of the current American food supply.

References Are Tip-Off

A good basis for appraising the technical quality of the book is shown dramatically and convincingly in the list of references given in the bibliography.

Readily available to any interested person are authoritative, scientific, and lay publications bearing on the subject of the book. Yet such references are almost completely excluded.

In their stead, one finds chiefly a list of writings notoriously biased and incomplete.

To estimate the degree of unfairness and inaccuracy shown in the book, consider the following quotations. And note how these belittle the conduct of persons and agencies that have an outstanding record for integrity and diligence in safeguarding the health of the public:

Quotes Show Unfairness

"Another problem is that frequently the people who are in a position to decide the issue of whether a chemical is harmful are judges or lawyers with no real understanding of the biological subleties involved, and, as evidence of harm to human beings they demand nothing less than a corpse."—page 7

"Most tests were designed to prove only that the substance in question was not instantly lethal." —Comment on industry and government testing.—page 11.

Opens With Poison Dart

Another tip-off to the character of the book is the opening gambit for attention and alarm. It suggests that apples purchased normally at

Flames and Breeds Confusion

the supermarket for children "*were probably shot through from peel to core with some of the most powerful poisons known.*"

Ignores Authorities

In contrast to the grotesque exaggerations and citations of much fringe-type literature, comparable citation of authoritative publications and views are practically omitted, such as:

FOOD & DRUG ADMINISTRATION:

Food Facts vs. Food Fallacies (1959)

"The American food supply is unsurpassed in volume, variety, and nutritional value.

"By patronizing all departments of a modern food store, we can easily supply all of our nutritional needs.

"Notwithstanding the abundance and quality of the American food supply, a persistent campaign is being carried on to undermine public confidence in the nutritional value of staple foods."

Nor are these sources of authoritative information cited:

NATIONAL RESEARCH COUNCIL:

(a) Problems in the Evaluation of Carcinogenic Hazard From Use of Food Additives. Publication No. 749 (1959)

(b) Principles and Procedures for Evaluating the Safety of Food Additives. Publication No. 750 (1959)

(c) Recommended Dietary Allowances. Publication No. 589 (1958)

(d) The Role of Dietary Fat in Human Health, Publication No. 575 (1958)

(e) Cereal Enrichment in Perspective (1958)

(f) The Use of Chemical Additives in Food Processing. Publication No. 398 (1956)

(g) The Safety of Mono- and Diglycerides for Use as Intentional Additives in Foods, Publication No. 251 (1952)

AMERICAN MEDICAL ASSN.:

Reports of the Council on Foods and Nutrition.

AMERICAN DIETETIC ASSN.:

Facts Talk Back–Food Information, Fallacies and Facts (1957)

[Editor's note: Food manufacturers can draw upon the above sources for facts with which to refute statements in the poison book.]

Neither is there acknowledgment of the fact that the great majority of scientists among food and related manufacturers and in the professional societies welcomed and cooperated in working toward improvements in the food laws. They did this to assure effective protection of the public and to meet changing circumstances.

The so-called "Delaney Amendment," however, was opposed by nearly all of the top ranking scientists within and outside the government agencies, with good reason. That amendment, unfortunately, was rushed into the Congressional bill during the closing hours for final joint action.

Scientists saw how unscientific and unsound this particular section, as then worded, would be in practice and in theory. It is left no reasonable opportunity for using judgment in arriving at a course of action.

Compounds Confusion

The resultant confusion already is evidence. Such confusion constitutes a handicap to effective administration.

The book in some degree will add to the confusion. —*End*

Calls for Consumer Education

FDA's Commissioner Larrick gave the following good advice to food manufacturers back in 1958*—and thinks it is equally pertinent today

TELL CONSUMERS why additives are used in foods and how the consumer benefits.

In recent years there has been a growing concern by the housewife over the safety of the food supply. Intelligent people are coming to us more and more for an answer to this question:

"Is it true what they are saying about our food supply? Is it really as bad as I hear?"

It is not enough for you in industry and for us in government to know the consumer benefits that result from the use of food additives. We must let the consumer know, too.

Let's start telling the consumer the facts about this country's food supply:

That our country has the best food supply in the world today.

That with the new Food Additives Amendment, it has the best safeguards it has been possible to develop.

And that the additives that go into foods are there to improve the food and to bring it to the housewife in better condition, and in a more convenient form.

Some people think the best way to deal with a food additive is to conceal the fact that it is used, keep the consumer from knowing what is present.

That is absolutely wrong in our opinion. The way to build consumer confidence in your product is to tell what the additives are, that they are safe, and what they do.

GEORGE P. LARRICK

Commissioner, Food & Drug Administration
Washington, D.C.

** In a speech to the American Chemical Society Symposium on Chemistry & Engineering in the food processing industry.*

The Opportunity:

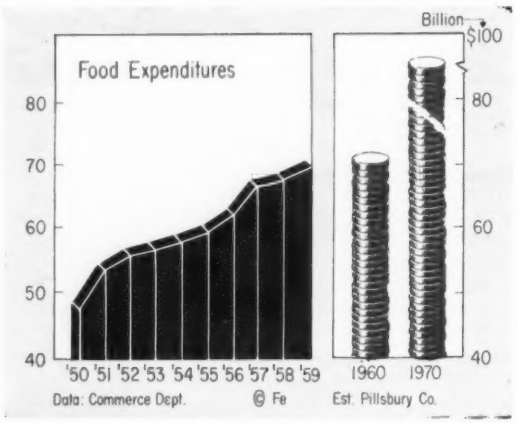
More mouths to feed . . .

Population Projections By Age Group

	1950 (000)	1960 (000)	'60 vs. '50
All ages	151,683	181,154	+19.4%
Under 5	16,320	21,019	+28.8%
5–19	35,123	49,782	+41.7%
20–24	11,620	11,311	− 2.7%
25–39	35,224	35,258	+ 0.1%
40–64	41,108	48,005	+16.8%
65 & Over	12,287	15,779	+28.4%
	1970 (000)	**1980 (000)**	**'70 vs. '60**
All ages	219,474	272,557	+21.2%
Under 5	26,662	35,961	+26.8%
5–19	65,436	83,799	+31.4%
20–24	17,343	22,014	+53.3%
25–39	36,340	50,787	+ 3.1%
40–64	54,144	55,470	+12.8%
65 & Over	19,549	24,526	+23.9%

Data: Census Bureau

. . . more sales



BIGGER — BUT SHIFTING — TARGET: Food makers will have expanding market to shoot at in the '60s as population climbs more than one-fifth. But heftier sales won't come naturally, since changing age make-up will mean stronger demand for some food items, less for others. Two attractive markets will be senior citizens and young family-formers. Styling of products to population groupings is seen spiraling food sales up to almost $100 billion before next decade.

What Do Next 10

One thing is sure—'60s will be as turbulent and fast-moving as the '50s . . . Here's what Pillsbury figures to be critical factors you must consider when mapping long-range strategy

LET'S SPOTLIGHT the key trends that will affect demand for your product in the decade that's just begun. The more important "influentials" that must be figured in in your long-range planning fall, roughly, into five areas – population, buying patterns, new products, research, and foreign competition.

First of all, there's population—both its size and composition. It's estimated that by '70 there will be at least 44 million more people in the USA who will be eating approximately as much per person as today's counterparts.

But, besides being just bigger, our population will have a markedly different age distribution—which will alter the demand for certain type foods. For a quick picture, see table (above) showing what tomorrow's youth market, for example, will be like.

These dramatic changes in age make-up present a tremendous challenge to food marketers. As we look at the growing teenage market in the '60's, and think of these young people as a wave that will move through the life cycle from ravenous teenagers, to marriage, to starting families, you can see what a tremendous job it will be to establish lasting brand loyalty habits.

At the other end of the age scale there's an increasing marketing opportunity to meet the special dietary needs of the older age group. This market has not been totally and successfully tapped by any food manufacturer, and a great deal of additional study must go into the medical background of the older person's food needs.

There is little question about the number of people who will be buying in the decade ahead and the fact that they will have increased incomes. The big question is: "What will they be buying?"

Pertinent here are the inroads being made on the consumer dollar by non-food items. While food will remain the largest single consumption item, more significant increases are and will be occurring in household and recreation goods and in other services. This is a warning that the food marketer will have a continuing battle to capture the same share of the consumer's spendable dollars that he has had in the past.

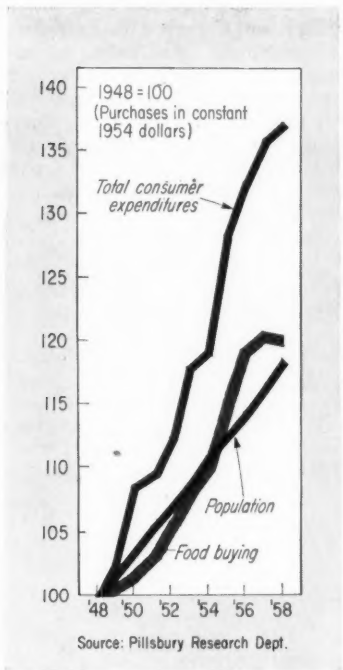
Along with more disposable income, tomorrow's average American is likely to have more leisure time,

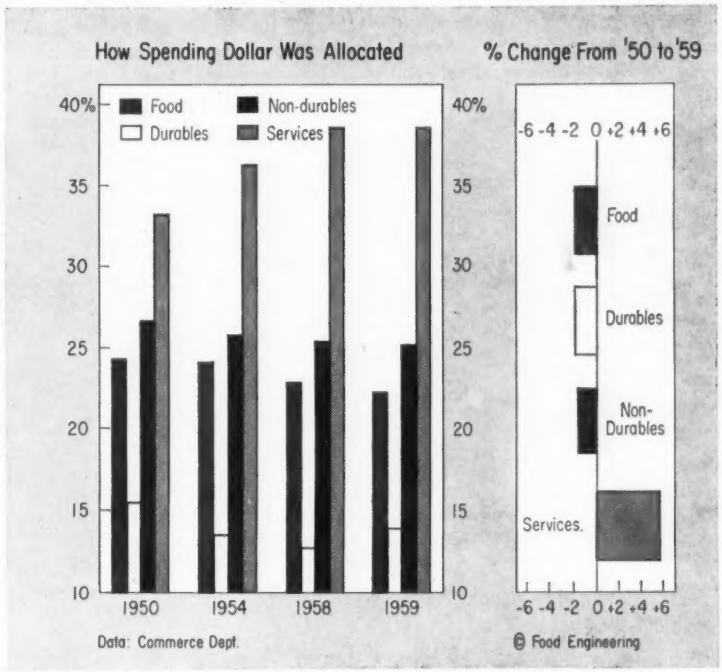
DEAN McNEAL

Executive Vice-President, Pillsbury Co., Minneapolis

The Challenge:

Rising outlays for goods, services . . . **. . . more competition**





AFFLUENT SOCIETY means rougher competition for food firms as leisure-minded consumers spend proportionally more on recreation, less on necessities. This trend became marked during '50s as share-of-outlays for services jumped a hefty 5.4%. During the same period, food's share of expenditures dropped 1.9%.

Years Hold for You?

and more spending opportunities. More appeals will be made to him for the use of these dollars, and many new and attractive uses will be suggested.

As the following figures show, food has been losing slightly in its battle to capture a fixed share of per capita disposable income.

PER CAPITA FOOD EXPENDITURES

	Actual $	% Disposable Income
'35–'39	$118.6	23.1%
'47–'49	319.0	25.6%
'58	397.0	22.2%

Also, had the industry been satisfied to maintain the same items in the "food basket" as were there in 1935-39, the decline in the share of disposable income captured would have been precipitous—from 23.1% in '35-'39, to 19.9% in '47-'49, and 16.0% in '58. This underscores the importance of developing new products and marketing techniques.

The same basic fact is seen from another approach. As the chart (above) shows, the percentage increase in food expenditures doesn't match the rise in total consumer expenditures during the past 10 yr.

Food marketers more and more will have to compete among themselves for a fair share of the consumer disposable dollar, as well as face rougher competition from other leisure time activities and goods.

One sociological question meriting attention is whether feeding the mass American market will become more of an institutional function than a home function. In times past, most meals were prepared and eaten at home. Today, an increasing number are eaten out.

In 1909, only 3% of food costs of city workers' families was for food and beverages consumed away from home. By '55, it was nearly 20%.

It seems obvious that as Americans become more mobile, more travel- and leisure-conscious, and have greater disposable incomes, there will be a continued increase in institutional feeding. And the food marketer will have the challenge of making the transition from a largely consumer-oriented business to a substantially institutional-oriented one.

During the past 20 to 30 yr., the diet has largely transitioned from starchy foods to the heavily protein. Cumulative effect of this change and future continuance of this same trend offer dramatic considerations for the food marketer.

The discoveries of medical science will have equally significant effects on American eating habits during the next 10 to 25 yr. Some of these trends, such as change in the use of certain fats and oils, are here now.

Should we not ask ourselves whether the public will heed the warnings or the admonitions of the medical men and alter some strongly ingrained eating habits? Or will the food marketer take the lead in effecting these trends? (*Turn page*)

I am inclined to bet on the latter. For example, it has long been a popular misconception that enriched bread is not an essential part of a well-balanced diet. However, medical science has proved it's necessary. It will be up to the industry to sell this story to the public.

Recently, a market research man checking protein advertising by cereal manufacturers stressed the average housewife's very low level of real knowledge of what protein is and what it does. She knows it's good. She knows her family should have some of it. But she doesn't understand the reasons for its value in the diet. Advertising that increases the awareness – and understanding – of this important part of our diet is necessary to get this story across.

As medical knowledge continues to expand, we can expect food products to be geared to this increase– meaning that food manufacturers will have to work closely with the scientists doing nutritional research.

Home to Roost

One of the penalties of innovation is that it rouses demands for more innovations. Somewhere along the line, the American public has become increasingly demanding for new and different food products.

Beyond this call for newness are challenging implications in the increasing geographical movements of American people. For example, at least 10 states are expected to have 142% more people by '70 than they had in '55.

This mobility will mean both the reduction of so-called geographical markets for food and special regional eating habits and the growth of a new kind of market segmentation. For, when people move around, they take with them their food ideas.

As more people travel within the U.S. and in foreign countries, there'll be a greater demand for increased product variety to enable people to repeat the pleasant food experiences they had in their travels.

Today, any meeting of sociologists quickly gets around to the subject of increased leisure-time people will have in the years ahead. This raises the question as to whether food preparation will become an art to be enjoyed as a part of this greater leisure, or whether it will continue to be more of a household chore.

Certainly, a large part of food advertising is built around the idea of taking the drudgery out of meal-making. With a combination of speed and convenience of food preparation, together with availability of time for other leisure-focused endeavors, the whole matter may be given a totally new role in the future.

Food marketers must face up to the realities of science, technology, and research in food processing, packaging, and distribution. Applying scientific techniques to production, accounting, distribution, and all the marketing elements, will make tremendous demands on capital appropriations. But the firm that isn't profitable enough to finance such scientific endeavor will fall behind.

The food industry is rapidly increasing its R&D budget, but not at the same rate as all other industry combined. Whether or not this relatively slower trend will be adequate to realize the potential of the 1960's is an important question that must be tackled, not only by general management but also by marketing managers, who must consider R&D as being in a very real sense a part of a firm's total marketing effort.

There are several factors which may explain the food industry's lag. For one thing, relatively low profits are a deterrent. Certain industries, especially those related to defense, are able to capitalize to a greater extent on government help.

Also, there's the fact that food executives for the most part are not technically trained people. For this reason, it's taken a somewhat longer period of time for them to appreciate the value of a completely adequate R&D program.

The best way to put profits in a better position is through an aggressive technological R&D program that develops new products, new marketing ideas, and new means of anticipating consumer wants.

If our marketer is to maintain his share of the consumer dollar, he must provide greater quality and more exclusivity. Chief factor influencing gain in a brand share is introduction of new or improved products, and this can only be done by those marketers who first develop, then maintain, some degree of exclusivity.

One trend that requires careful thought by both manufacturers and wholesale and retail distribution organizations is the private label business. As maker of a nationally advertised brand of products, we view PLs as competition.

Although this competition with PLs is normal, it is important that those organizations developing and selling private-label brands understand the contribution made to their own sales and profits by the very methods used against them.

New and improved products from manufacturers' laboratories, for example, expand the total food market and create more sales opportunities for the retailer. Even more important, our ability to influence the buying habits of millions of housewives through national sales promotion increases the share that is spent for food out of each consumer dollar.

In the decade just begun there will be immense problems resulting from selling and distributing relatively new products. These may result from new methods of preservation, such as frozen or refrigerated foods, or foods preserved by irradiation or freeze-drying, or they may be completely new specialty lines. They will require new sales approaches, new methods of handling and distribution, and they will bring new competition.

Two-Way Traffic

A final factor you must include in your planning is the effect of foreign competition.

The new decade may see a flood of highly processed American foods being placed on foreign markets. These will come from plants established overseas by American processors, as well as from foreign processors who adapt American products, techniques, and merchandising methods.

Before the end of the decade, a peculiar marketing pattern will shape up. The expected reduction in freight costs may enable the foreign processor to compete with his American competitor on at least even terms. Further, the facilities of American processors overseas may well be either supplying products for their American distributors, or will actually be competing with their parent companies selling the same product or more glamorous gourmet items "made overseas."

A counter invasion of overseas markets by U. S. manufacturers is a reasonable assumption. Since at present American consumer goods overseas are thought more desirable than local products, our manufacturers should find this area lucrative, even though a local firm might soon be in a position to undersell the U. S. competition.

This article has been based on a talk before the Minnesota Chapter of the American Marketing Assn.

CIRCLE 47 ON READER SERVICE CARD→

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WILPAK'S NEW LINE OF PLASTIC CONTAINERS

ENGINEERED QUALITY! Wilpak's new line of plastic containers have that quality look and thick-wall feel that helps quality products maintain price and increase sales.

You see the difference in your profits, just as your customer sees the difference in the eye and taste appeal of your product.

Watch your repeat business grow when you protect freshness and flavor, keep out moisture, and add to handling and storage convenience for both the store and the consumer.

At no obligation, get full details now on the Wilpak packages that help both sales and profits.

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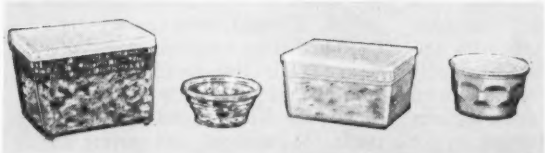

New Wilpak Plastic Containers come in many styles, sizes, colors, clear or opaque. Medium wall for economy, heavy walled for field strength and serviceability. Lids can be imprinted or paper labels applied.

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Please send free samples of your new plastic packages and the NEW LOW PRICES *on the* 1960 WILPAK *Line.*

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INDIVIDUAL TITLE

AUTOMATED LUNCHROOMS replace the old lunch box. Versatile machines that dispense soup-to-dessert menus, and trend away from heavy noon meals, combine to make in-plant feeding one of fastest growing segments in automatic merchandising.

Trend to Food-Vend Picks Up Speed

Profitable expansion in machine selling spearheaded by new products, packages, and merchandising services . . . Opportunities in plant feeding, between-meal snacks, and automatic purveying of staples outside supermarkets offer diversified outlets

WITH MOST forecasts predicting a striking upsurge in "away-from-home eating" during the '60s, you can expect a lot more interest in the machine vending field as a growing and diversified outlet for food processors.

Reason is that automatic merchandising, already big business, is getting bigger as the trend to vend more packaged goods picks up more momentum.

Last year, for instance, some 4 million vending machines dispensed about $2¼ billion of goods and service (the bulk of it foods and beverages). And the more optimistic estimates point to sales reaching $5 billion by '65.

Right now, automatic cafeterias are the hottest thing in the 'silent selling' field. That's because of the fast spread in in-plant feeding (see FE Oct. '59, p. 60) and the improvement in equipment.

Pop Paces Eats

However, the largest share of sales still goes to the old standbys—cigarettes, soft drinks, candy, and coffee. National Automatic Merchandising Assn. estimates that '59 sales reached $633.2 million for soft drinks (second to the smokes), $225.0 million for candy, and $189.6 million for coffee and hot beverages.

Last year, for the first time, coffee sales were broken down between the three major brewing methods. Greatest coffee volume was siphoned off by the instants ($75.2 million), followed by liquid concentrates ($61.2 million), and fresh-brew ($53.2 million).

NAMA says volume for sandwiches and pastry almost doubled to $52.5 million last year. Milk (indoor locations) topped $85.6 million, ice cream $27.2 million, and cookies and crackers $31.0 million.

Although vended hot platter-type meals are now possible, most of the estimated hot food sales in '59 ($21.2 million) came from heated canned items.

Mainstays of the 30-yr.-old vending business made worthy sales showings in '59. Some $19.7 million worth of chewing gum was sold in '59. Bulk penny sale of candy, gum, and nuts totaled $36.5 million.

Industry is just turning the corner from what was only a method of supplementary or convenience sales. Today, automatic merchandising of hot foods—a long-term, eye-opening potential—is accounting for an increasing percentage of sales and will develop more rapidly as factories, offices, and institutions switch to this efficient method of feeding (see also FE July '59, p. 29).

Industrial designers are giving "automatic cafeterias" a smart look through "area treatment" that coordinates vending machines with surrounding decor to create a friendly feeling. Specifically, murals located above a bank of machines tie the area together, also focus attention on the venders. Machines are of one or contrasting colors to complement the overall color scheme.

One industry leader, A. Goldman, president, G. B. Macke Corp., says: "Automatic cafeterias can already vend about 90% of the varieties of foods most workers want for their 'away from home' meal. Stimulating this trend is the growing popularity of the half-hour meal period, rising costs of conventional cafeteria operation, erection of new plants in outlying areas, and excellent endorsement from management experienced with coin-operated cafeterias."

Slim Look Helps

Goldman also feels that diet-conscious Americans are veering away from the hearty lunch and are eating more light foods that can easily be vended.

Vending firms are seeking closer collaboration with industrial caterers to resolve more sharply specific areas of operation. Caterers have become vending operators, and vendors have taken over catering. Some vendors even own and operate restaurants.

NAMA points out that the greatest revolution will be in automated hot meals brought almost instantly (within 15 sec.) from frozen or refrigerated stage to piping hot condition. While this trend is sure to continue, its growth rate will depend upon: (1) Variety and quality of foods, (2) packaging and serving im-

ALL-PURPOSE unit dispenses up to 130 different food and beverage items, in varying sizes and shapes, at drop of a coin. Equipped with insulated windows for product visibility, vendor (Rowe) permits products to be sold at ten different prices (from 5¢ to 50¢).

provements (plastic and aluminum foil trays for hot foods) and (3) improvement of machines to heat and vend frozen foods.

Machines now on location—plus those in development—are reportedly able to hold frozen foods at proper temperature. But, vendors say, frozen food packers haven't realized the potential that's yet to be tapped.

One vending spokesman, H. E. Saunders, of Vendo Co., doesn't think too much of the meal-in-a-can package. Once it's dispensed, he says, a heated can must be juggled to be opened and handled. What he wants is a dual-purpose package—a combination container and serving tray.

However, leading food processors who have pushed automatic catering of hot canned "entree-type" foods and soups counter that consumers' reluctance to eat out of cans is being overcome by single-service dishes supplied on location. They've also learned that acceptance of hot canned food vending by employer and employee has been so far ahead of expectation that they've been prompted to offer a wider variety of items.

A. D. Stevens, also of Vendo, foresees more attractive packaging. Already, he says, tests are underway toward designing plastic containers in a rainbow of colors and in every possible shape compatible with existing vending equipment. Colored foil, he feels, is also a good bet in the race for better looking prepared food packages.

If competitive struggles lean in favor of caterers instead of frozen food packers, then a lot of semi-automatic packaging machines will be in demand. Another problem will be public health and sanitation.

Retail Sales Eyed

Also just around the corner are automatic supermarkets. Already store operators are experimenting with robot sellers to extend retailing beyond the 6-day week.

For example, banks of machines outside of Grand Union's East Paterson, N. J., store, dispense such items as bakery, dairy, and meat products around-the-clock. Two big advantages: The machines can be installed far cheaper than it takes to construct a store, and they can be placed at locations affording reductions in merchandising costs.

Supermarkets are also building automatic merchandisers into their store fronts to dispense basic necessities (butter, cheese, milk, bread, packaged coffee) for late night and Sunday shoppers. And, with rising costs of labor and shorter work hours affecting more retail stores, scope of vending should broaden to take over tasks that no other form of retailing could handle economically.

One development that's sure to spark stores into more off-hour vending is availability of automatic cashiers that take dollar bills and give change in coins.

Just where this type of automatic merchandising will lead may take some 'cloud-9' conjecturing (see p. 50). An exciting possibility is a pushbutton-selecting panel for shoppers. Packages thus 'signaled' would be machine sorted and conveyed to a central delivery station, where a computer would total up the bill. Shopper would then feed dollar bills to a coin changer that would release correct change along with groceries.

NAMA sees more food men processing, packaging, merchandising, and advertising in the machine-dispensing field. Here, continuance of the private-brand battle is also foreseen, with large suppliers introducing their own brands, and thus bringing those supplying national brands to make direct competitive merchandising appeals.

Still More Gold

Bottlers of soft drinks, who have probably exploited automatic merchandising better than any segment of the food field, still see great new untapped potential. They look to

Pushes $1½ Billion

1959 Estimated Sales of Automatic Food Merchandisers

Vended Product	Sales (Thous.)	Est. Machines on Location
Bulk Items (candy, gum, nuts)	$36,500	730,000
Candy	225,000	500,000
Chewing gum	15,750	315,000
Gum sold in candy machines	4,000	.....
Coffee and hot beverages	189,600	100,000
(a) Liquid concentrates	61,200	34,000
(b) Instants	75,200	47,000
(c) Fresh-brew	53,200	19,000
Cookies, crackers and biscuits	13,000	.....
Same sold in candy machines	18,000	65,000
Fruit juice	4,500	4,500
Hot food	21,150	23,500
Ice Cream	27,200	31,000
Milk, indoor locations		
(a) Cups	2,400	1,200
(b) Cartons	83,200	52,000
Sandwiches and pastry	52,500	35,000
Soft Drinks	633,200	1,036,000
(a) Bottles	450,000	900,000
(b) Pre-mix	68,000	40,000
(c) Post-mix	115,200	96,000

Source: National Automatic Merchandising Assn.

ULTIMATE IN SELF SERVICE: Seen for long-range future is automatic supermarket completely outfitted with robot salesmen. Items pushbutton-selected by housewives will be machine conveyed to central point, where computer will total shopper's bill and machine change-maker will serve as check-out. Big challenge is to design versatile units for wide product choice.

future vending programs providing better stabilizing of production and sales.

One large bottler states that this optimism is encouraged by the number and variety of soft drink machines. They're now in stores, schools, hospitals, plants, theaters, military installations, service stations, transportation terminals, etc. He says this method of vending not only is important to sales volume but is also influencing the take-home market.

Strong competition in soft drink vending has bettered service. Up to now, market has been dominated by the post-mix machines that blend syrup and carbonated water into cups. Reason they've become the high-volume leader is because of selectivity (up to 10 different drinks per machine) and capacity (up to 2,000 cups). What's more, they also feature name brands.

Offering these units sharp competition is the relatively new method of preparing cup-sealed pre-mixes at a central source. Suppliers feel that they give better control over quality uniformity. Moreover, pre-mix dispensing has forced some bottlers to diversify by adding such other items as coffee, cookies, and crackers.

Another source of competition is a mechanical soda fountain machine that makes its own ice, crushes it, stores it, and then, at a touch of a button after insertion of a coin, dispenses any of a selection of six flavor varieties of drinks with crushed ice.

Directly or indirectly, the recent developments will surely affect future food merchandising. Now arriving is equipment to satisfy operating companies' growing demand for the more versatile multi-feature dispenser.

Such a machine is seen the equivalent of store or cafeteria counters that offer a variety of packaged foods to the customer at different prices. It gets away from single-purpose candy, pastry, coffee, soft drink, and sandwich units.

Typical is an automatic vending machine "cafeteria" (Rowe Mfg. Co.) that holds up to 130 packaged foods and drinks of varying sizes and shapes. Another multi-product merchandiser, dispensing up to 400 items in price ranges from 5¢ to $1.25, handles almost any size or shape package, even loaves of bread, milk in bottles or cartons, carton-packed eggs, and whole roasted chickens. One unit is even designed with one section hot and the other refrigerated.

Geared to Packages

Such machines have been developed to overcome the major problem of accommodating and dispensing standard package shapes and sizes that are sold to the buying public through other outlets. By handling such packaged foods, chances of dispensing machines becoming obsolete because of changes in product-packaging are minimized.

A new sandwich vendor stocks a variety of refrigerated, packaged sandwiches. Another dispenses cold, warm, hot, and toasted sandwiches—all made from a variety of breads. Even small firms are starting up, preparing and machine-wrapping a wide variety of sandwiches for these silent salesmen.

Dairies show interest in a new milk-shake vendor as a medium for their pre-mixes. Coffee firms also eye new developments in fresh-brew vending machines.

A Rudd-Melikian unit brews (in 6 sec.) percolator-grind coffee sealed in filter tape that hold 500 portion-controlled packets. As a coin is dropped, a packet of ground coffee (from rollstock) is drawn to and pressure-locked by a brewing chamber, where percolator-hot water is pressure-forced through the packet to "perk" the coffee into a cup.

Coffee firms, realizing the market potentials, are pitching in by offering their services. Take, for example, General Food's vendor aids program—a "brush-up" course for all levels, routemen right up through management.

An evening course, it accents ways vendors may step up efficiency and profits. Also, it enables GF to learn more about the vendor's operation and, thereby, serve him better.

Hill Bros. has taken steps to assure better quality dispensed coffees by nitrogen gas-packing its instant coffee in heat-sealed foil-polyethylene bags. Company permits decal-identification of its products only after machines (on location) are spot-checked for appearance, sanitation, and temperature control.

Suppliers of packaging materials, recognizing the potentials in vending, have come up with package improvements. Big problem being licked is package-jamming in the machines.

Just patented is a "Klicklock" vend pack for jam-proof dispensing of such powders as coffee, tea, cream, chocolate, and soups. Further development is a polyethylene-lined odor-taste-free drink-vending cup with rolled-under brim to eliminate jamming. Cups will operate in 180F. dispenser's heat chamber.

"Message" cups are even available in a variety of colors. They're being used in plants as a focal point in drives to promote safer working habits, economy, neatness, and alertness to product quality.

A new advance in hot food vending is Campbell Soup's insulated label. Employed is a protective underlabel that eliminates customer discomfort caused by cans that are too hot to handle.

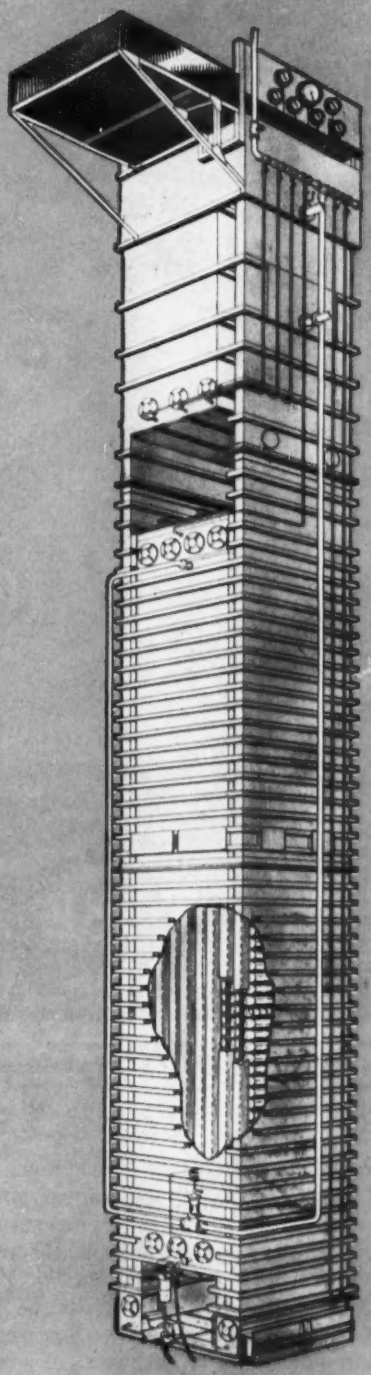
Imagination is featured in a new combination package that consists of foil-wrapped cheese and cello-wrapped crackers, both overwrapped with cello on a cardboard stiffener.

—FE Staff

CIRCLE 51 ON READER SERVICE CARD→

Now, from France, for your plant and profits

. . . a sensational (and proved) saving step in canning!



For a long time, continuous pressure cooking and cooling presented many problems in mechanics and heat exchange. *But now, a revolution from France!* Introduced just a few years ago, the genuine CARVALLO hydrostatic continuous cooker and cooler has been constantly tested, refined and improved. Today, it is considered the finest unit in the world, matching your own product quality standards.

Only the genuine CARVALLO hydrostatic pressure cooker-cooler gives you these exclusive features . . .

1. **Preheating and Cooling under Integral Counter Flow** saves up to 80% in steam and cooling water.
2. **Fully Automatic Self-controlled Unit,** directly coupled to seamers and labelers or casers, saves 100% in processing labor.
3. **Specially Designed Chains** are rugged, durable. Do not stretch or wear. The end of the carriers are closed by the chains, preventing jamming and lateral friction and damage to the cans and jars.
4. **Hydrostatic Controlled Pressure** insures an absolutely constant temperature during sterilization, eliminates transfer valves and all their troubles. Pressure variations inside and outside of cans are progressive! No exploded peas! No clouded juices! No leaking seams!
5. **Tubular Carriers Unattached to the Conveying Chains** — the same unit can process, without any change parts, cans, jars or bottles in a wide range of sizes and shapes. No jamming through dented cans or broken jars. Easy automatic loading and unloading. Carriers can be removed very quickly for yearly inspection.

Air mail or cable . . .

MAISON FRÉDÉRIC FOUCHÉ

Food Machinery Department
3, route de Saint Denis,
LA COURNEUVE (Seine)

Built in FRANCE by: Maison FREDERIC FOUCHE 8, rue Eugene Varlin, PARIS 10°
Patented and technically directed by: Pierre CARVALLO 24, villa Dupont, PARIS 16°

LACTOSE... ADDS A MAGIC TOUCH TO EVERY TYPE OF FOOD PRODUCT!

Regardless of what type of food items you produce, you are certain to find ways of improving their appetite appeal with Lactose.

Among its many valuable properties, this amazing milk sugar enhances flavor, absorbs and holds color in foods, preserves aroma and aids proper browning and carmelization.

Only Western can supply Lactose in the full range of particle sizes required by various food applications. Strict chemical and bacteriological specifications, rigid quality control and years of processing experience assure highest quality.

Take a good look at Lactose. Send for the facts and figures today. For complete information, prices, product samples and bulletins on Lactose, write our Technical Service, Department 16D. Be sure to tell us about the applications you're considering.

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

World's Largest Producer of Lactose—Pure Milk Sugar

CIRCLE 52 ON READER SERVICE CARD

WESTERN PRODUCTS THAT GIVE FOODS EXTRA APPEAL!

VALLEY FRESH SWEET DAIRY WHEY
A 100% pure dairy ingredient that meets or exceeds all U.S. Extra Grade standards. It improves product quality and cuts costs when used as a partial replacement for sugar, as part or all of the dairy solids, or as an additional ingredient in formulas with marginal dairy solids or sugar requirements.

FOREMOST LACTOSE
Pure milk sugar that will add appeal to all manufactured food products. It is low in sweetness, soluble, free flowing, boosts flavors, absorbs pigments, controls sugar crystallization and offers nutritional advantages.

VALLEY FRESH TEKNIKAN
Gives food a natural, accentuated dairy flavor. Recommended for fillings, icings, toppings, cheese products and all other formulas requiring dairy solids and a pronounced dairy flavor.

VALLEY FRESH ANGEL WHIP
It whips! Plant tests prove Angel Whip provides superior marshmallows, toppings, fillings and other aerated products.

VALLEY FRESH DAIRY BLEND
A Western exclusive blend of high quality dairy solids. Packaged as a unit to ease your storage problems. Lets you incorporate premium dairy solids in your formulas at lower cost.

For information on any or all of these products, write Technical Service, Western Condensing Company, Department 16D, Appleton, Wisconsin

WESTERN CONDENSING COMPANY
Appleton, Wisconsin

World-Wide Producer of Quality Milk Products

DIVISION OF DAIRIES, INC.

Nip Other Firm's Head Start?

From files of *National Consumer Panel of Market Research Corp. of America.* Material is factually correct. Identities of products and companies have been masked to insure anonymity.—The Editor*

MARKETING CASE HISTORY OF MONTH

Management's problem

THE RAPID GROWTH in certain areas of Brand Z, made by a newcomer in the grocery field, poses a potential threat to our company. Although we don't as yet market a directly competitive product, we currently have one in the development stage.

Continued success by Brand Z may force us to speed commercial introduction of our product. On the other hand, if Brand Z turns out to be a temporary phenomenon, we'd rather put our energy and money behind other products in our line.

We want to find out as soon as possible what the future holds for Brand Z. Initial research indicates that saturation advertising appears to be responsible for the item's high sales volume. Lab tests show the product's quality to be inferior to that of existing competitors as well as to our own forthcoming brand. In addition, we feel Brand Z is overpriced, undistinguished in package design, and backward in respect to in-store merchandising.

These facts lead us to assume that there will be relatively few repeat buyers, and that sales will drop sharply once the "new customer" peak is reached. Before acting on these assumptions, we want verification based on actual measurements of repeat buying rates for Brand Z.

WHAT WOULD YOU DO?

Management's decision

We consulted the purchase records of families in the National Consumer Panel for those markets where Brand Z was sold. Thus, we obtained a complete history of Brand Z purchases by these representative families since the product's introduction.

We found that in none of the markets did the brand's sales show signs of slackening. The rate of new-buyer attraction was indeed high, and the percentage of repeat buying was also impressive for the product class.

Furthermore, the large number of, and relatively narrow interval between, repeat purchases indicated extensive in-home usage. Our lab findings to the contrary, housewives apparently were sufficiently satisfied with Brand Z.

Hence, it was obvious that, unless challenged by a promotional effort that matched its own, Brand Z would maintain or even increase its share-of-market. So far, none of the existing competitors has launched such an effort.

Result of action

We are now proceeding on the assumption that Brand Z is an important factor to be reckoned with. We are speeding introduction of our brand in markets where Brand Z is not yet distributed so that we can gain as strong a position in those areas as possible. While we have not yet met Brand Z head on, we know that when we do, a continuing, aggressive marketing effort will be called for if we are to compete successfully.

*For more information, write to Marketing Editor, FOOD ENGINEERING, 330 W. 42nd St., New York City 36.

MARKETING SIGNALS

Slow Boat to Heaven

The ever-cagey consumer isn't dazzled by the glittering adjectives with which orators have gilded the new decade—to judge by what's happened the first two months of '60. Although personal income (annual rate) ran 6% over the '59 period, total retail sales edged up only 3%, and food store volume barely kept pace with a 1% gain. One striking consolation: Sales of eat-and-drink places shot up 8%.

On the manufacturing front, food and beverage firms upped their output 5% in Jan. '60 vs. year-ago period. But price pressure restricted the sales gain to 4%.

Price Deals Bust Out All Over

Rougher competition on the price front is detailed in a new study by Market Research Corp. of America. Analyzing consumer purchases of 37 representative food store items, MRCA found that deal transactions in 34 of the products were greater in Jan. '60 than in the '59 period.

Heavy dealing (more than 20% of transactions) involved only 1 food item in the '59 month vs. 7 this year. Medium dealing (10-20%) covered 10 products this year as against only 6 a year ago. And of the 19 items where deals accounted for less than 10% of transactions, 16 showed greater use of price inducements.

Setback for Affluent Society

There's no mass market yet for a Cadillac food line, General Foods concludes in calling off its 2-yr. Gourmet foods test. Says Chairman Charles G. Mortimer: "The market simply isn't growing fast enough to provide the necessary turnover and volume." Oddly enough, when GF introduced the line near the end of '57, it stressed the fact that the market was limited.

There's evidence that GF was dissatisfied with the line's performance long before the white flag was run up. Ad support in magazines totaled $101,223 in '58, but last year it was slashed to only $44,162.

Several months ago, GF dropped the original aim of concentrating on posh department stores and tried to get the line into supermarkets (at lower prices) to pep up sales. Later, it scrapped the special Gourmet sales crew and had the topnotch Maxwell House sales force carry the ball. When that didn't pan out, GF decided this pioneering wasn't profitable.

One aspect of the trial that left observers puzzled was GF's choice of test markets—Los Angeles and Boston—when it tried to expand the line into supermarkets. The West Coast city is a hotbed of price wars, and Beantown is the home bailiwick of S. S. Pierce, strongly-entrenched specialty foods maker.

'Good Mother' Policy Expands

Betting that mothers in foreign lands will go for convenience feeding as enthusiastically as their American counterparts did, Gerber and Beech-Nut (Nos. 1 & 2 in the field) are racing to establish overseas markets.

Recently, Gerber set up an international division to handle licensing arrangements, organized a wholly-owned subsidiary in Panama, and finalized a program to have products packed under its brand in Japan and Venezuela. Aiming for a foothold in the European Common Market, Beech-Nut joined with General Milk to set up a plant in West Germany.

Food Advertising Sets Pace

Outlays by food products manufacturers in magazines, Sunday supplements, and network TV continued to dominate those media in '59, Leading National Advertisers, Inc., reports. Food and food products expenditures reached $238.3 million, vs. $220.8 in '58, and led all product classifications.

Ad spending by confectioners and soft drink firms rose from $23.3 million to $27.9 million. Beer, wine, and liquor outfits anteed higher on promotion—from $48.4 million to $59.7 million.

BRIEFS

Instant tea may emerge as one of the hottest products of the year. Several well known brands (including Lipton, Tetley, and Chase & Sanborn) are said to be readying strong kick-off campaigns in the near future.

Gerber will expand deeper into non-foods with full line of plastic baby toys following success of its infant clothing. Aim: Higher margins than baby foods offer.

PL frozens surge ahead: Certified Grocers' gross frozen food sales climbed 22% last year, but case shipments of co-op's own brand skyrocketed 400%.

Processed items take bigger share of potato usage—18% in '58 vs. 14% in '56, reports USDA.

Merger trend in automatic vending field is quickening as firms move toward "complete package" concept whereby one source supplies all that's needed in a location.

Product mix at Nabisco is as follows, according to H. Hentz & Co.: Biscuits, crackers, and cookies, 78%; bread and cake, 8%; cereals, 5%; pretzels, 4%; pet foods, 2%; other, 3%.

Fourth annual "Spectacular" promotion by National Assn. of Retail Grocers and *SatEvePost* is set for Oct. 20-29. Last year's event chalked up 172% average increase in weekly sales for featured products.

Chain supermarket lab that measures sales techniques under actual in-store selling conditions has been set up by Marketing & Advertising Assoc., Philadelphia.

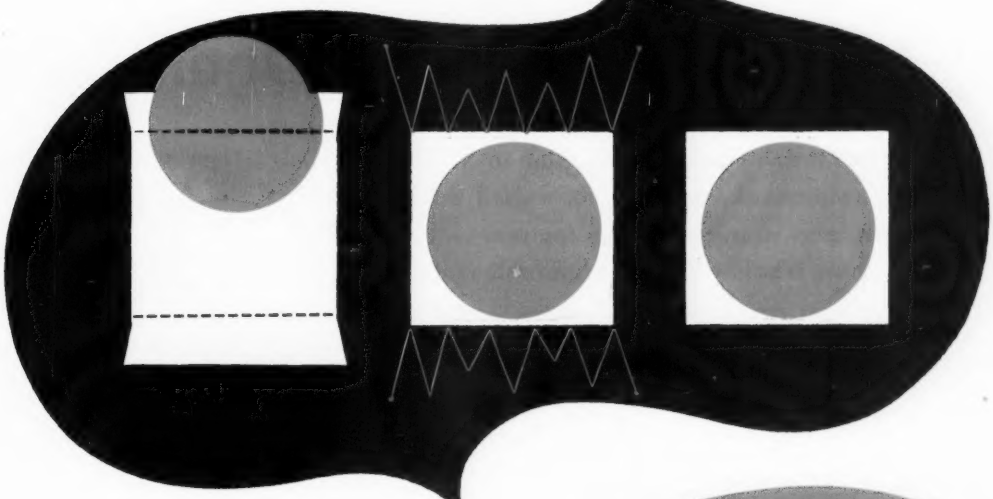
Vending machine that dispenses take-home 6-packs is offered by Pepsi-Cola and Vendorlator Mfg.

Hefty gain in soft drink tablet sales is looked for by Warner-Lambert. Firm says it sold 384 million "Fizzies" tablets in '59, expects to sell 60% more this year.

Management seminar in advertising-marketing is due at Harvard Business School, July 24-Aug. 5, sponsored by Advertising Federation of America.

PACK IT

WITH RADIO WAVES



CCA's new Di-Electric Sealer positively seals cartons by the heating action of radio waves on cold glue.... High-frequency waves eliminate de-waxing necessary with conventional sealing methods—and unwieldy overwraps. Provides fast, smooth production, plus protection and merchandising advantages. To **pack it—move it—sell it** is the business of CCA packaging. For details...

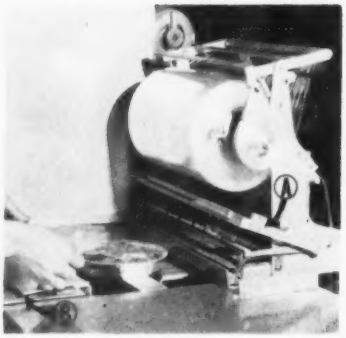
CCA

CONTAINER CORPORATION OF AMERICA

Chicago 3...and all key marketing areas. Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products

Here's 'How' of New Shrink-Cover Technique

BEFORE day's run begins, operator sets controls governing heating cycle of heating chamber.



FILM is drawn across cake pan, and cutting blade (A) is actuated when operator rests hands on plate (B). Moving fan (not shown) "pulls" wrap down so it won't slide off tray.

FOOT-OPERATED pedal starts conveyor that carries covered cake pan to heating chamber. Maker says film has the biggest heat-seal-temperature spread of any current plastic wrap.

Irradiated Poly Film Opens Way

Stretch-shrink plastic with built-in "sealer" shows unusual versatility for varied applications, plus strong protective features . . . And the price is below that of comparable materials

SHRINK-TYPE polyethylene film now lifts the curtain for new food-packaging technique, offers stronger protection against handling abuses, and carries a low price tag.

Making its debut last month, this roll-type film, which has its own built-in "sealer," is said to be suitable for use with a wide range of food products—in fact, it already has been successfully tested with meats, baked goods, cut-up poultry, fresh and frozen items, and candy.

Key to the film's versatility is the use of irradiation during the formulation stage—when an electron beam generator bombards extruded poly tape with up to 2 million volts. The result of 3 yr. of intensive research by W. R. Grace & Co.'s Cryovac Div., the film (Cryovac Type L) reportedly is the first commercially successful rayed plastic packaging medium.

When the electrons strike the tape during processing, the polymer's resulting molecules become unstable and, hence, reactive. Continuous bombardment by the high energy source causes chains of molecules to become cross-linked like a tightly woven fish net. This, in turn, increases the film's strength more than 500% and enables the material to be "stretched" in both directions more than 200%.

The stretching process (biaxial orientation) gives the film its crystal-clear clarity as well as its dramatic shrink-energy characteristic. According to Grace, the film immediately contracts 20% when exposed to 180F., and continues to do so as the temperature is raised, until it returns to its original size.

Here are other advantages of the film said to result from the raying process:

. . . **6 to 8 times stronger** than conventional poly. This makes for packages that stand up better against handling abuses and which display well in the store regardless of temperature or humidity conditions.

. . . **Unusually wide sealing range,** from 300 to 500F. Cryovac claims this is the biggest seal spread for any plastic film now available.

. . . **High degree of shrink tension,** enabling film to keep its desired shape or size.

. . . **Low tear strength,** enhancing the use of pull-tab devices for opening tightly sealed packages.

. . . Prints up to four colors on flexographic presses.

. . . **Attractive gloss and clarity.**

. . . **Good heat resistance,** with less tendency to flow at high temperatures.

. . . **Easy heat-sealing,** through as many as 7 or 8 layers.

. . . **Very low in brittleness** and doesn't dry out on aging.

. . . **Fast gas transmission.**

. . . **Holds up well** at temperatures ranging from −70 to 115F.

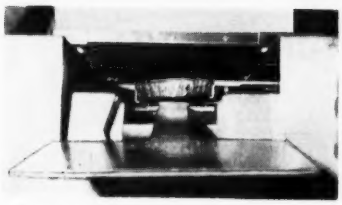
. . . **Excellent resistance** against acids and alkalis, fair against sunlight. Also low water absorption.

Trials Successful

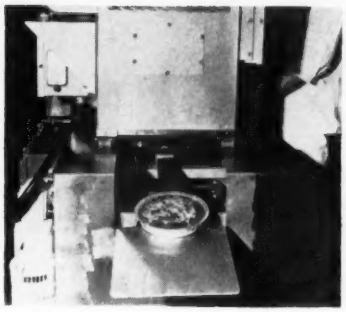
Food manufactures have been field-testing the film for little over a year. At first, Grace slanted tryouts to the meat and poultry fields, where it's gained considerable experience with conventional Cryovac (PVC) film.

Today, more than 100 firms are using the film. Included are such well-known names as Armour, Swift, Wilson, and Safeway. In fact, it's said that over 10 million frankfurter packages with Type L have already been sold.

More recently, the film has been catching on for frozen foods (Farm House Pies), baked goods (General Baking, Horn & Hardart, Cushman's), candy (E. J. Brach & Sons), as well as a number of fresh fruit and vegetable items. And Boston's Seiler



CONTAINER is lifted to mouth of heating chamber, where squirrel fan drives controlled hot air blast against film, causing it to shrink to tight fit around foil lip.



SEALED pan is then ejected onto take-away conveyor. Semi-automatic unit has aproximate 30/min. rate although output can be raised when shorter heating cycle is used.

to New Packaging Methods

restaurant chain employs it as a transparent cover for its prepared meals distributed in compartmented trays.

Welcome Price News

Despite the fact that the electron beam generators used in the processing stage cost $100,000 apiece, 1-mil Type L carries an attractively low price tag—only 3¢/1,000 sq. in. (unprinted). This puts it below such comparable films as Saran (4¢/1,000 sq. in.), Videne (4.36¢), and Reynolon (3.3¢). And it keeps it competitive with cellophane (2.7-3.3¢) and regular poly (2.7¢).

Significantly, Cryovac sees the new film's unusual stretch-shrink factor pointing the way to at least 3 new packaging techniques (see pics) where the material's built-in "self-wrapping mechanism" can be utilized. These are:

Shrink-on cover for baked goods and frozen items. Here, a square piece of film is laid over a foil pan, which is then passed through a Cryovac-designed heating chamber. Hot air shrinks the film to a tight fit, and the plastic "seals" itself to the curled lip of the tray.

Shrink-sleeve package for fruits and vegetables. Film is slipped on as a sleeve over a cardboard fruit carton, then bottom-sealed as unit passes through a cooler-sealer. The barrier-type wrap is left open at both ends of the package to allow fruit to breathe. This technique has gone over well with West Coast apple growers because the film's tight fit "locks" the fruit into place, thus preventing jostling and bruising during long-distance shipments.

Twist-tie wrap for loose items, such as cabbage or lettuce. Product is rolled up in the film and the loose ends knot-twisted. Hot air shrink-tunnels make the wrap contour-fit the item.

Cryovac looks on the developing central prepackaging market as an ideal one for Type L. Company says the film and companion machines will enable manufacturers of cut-up poultry, for example, to do the packaging job much more economically than at the individual chain store level.

Automatic Handling Targeted

An ambitious machinery development program designed to take advantage of the film's properties has been mounted by the maker. For the present, though, Cryovac says the film handles well on these commercial units: Crompton & Knowles Wrap-King (Models M, 6F, and P2), Hayssen frankfurter (Model 43L), and Corley-Miller's hand-wrap and automatic frankfurter.

These machines have to be modified by the addition of a cold plate to cool the seal. Also required is a shrink tunnel.

Hand-wrap units range from $300 to $400 apiece. And the shrink tunnel and cold plates for automatic overwrappers run from $500 to $3,500.

Cryovac also offers prototype semi-automatic units for use with baked goods trays (capacity around 30/min.) and produce (60-90/min. for cabbage, for example). But the company hopes to have completely automatic equipment out by the first of '61. It's reported that purchasers of the semi-automatic units may apply the purchase price against the fully automatic equipment when it is available.

Up to now, the supplier has worked primarily with regular density linear poly. Eventually, it hopes to extend the irradiation process to additional polyolefins, including low and high density poly, polypropylene, and various copolymers. An irradiated high density poly, Cryovac believes, would have even higher temperature resistance and greater stretch and shrink tension than the present film.

Type L has been OK'd by FDA and other government agencies which pass on food packaging materials, Cryovac says. Company points out that the film is still inert after the raying treatment because the voltage used is only one-fifth of the amount required to induce radioactivity. Animal feeding and other tests, conducted the past 2 yr., show the film to be safe, the company says. —*FE Staff*

HOW MACHINE WORKS: From 4 peelers (background), franks move onto revolving conveyor. Girls stack rows on cards moving into infeed stations (center), and stacks are raised into rotating-pocket wrapper (right). Inset: "Collarless"® packages use only bottom card and cellophane.

Unit Triples Frank Packaging

Sales boom, too, is credited to automatic wrapper-sealer —for it boosts packer's performance in meeting shipping dates . . . And labor and material costs are cut

NOT ONLY increased volume but also increased sales can be chalked up by boosting packaging-line performance.

Demonstrating this lucrative step-up is John Krauss, Inc., Jamaica, N. Y., meat packing firm. It fitted its line with new automatic equipment that tripled frank wrapping and sealing capacity–and now sales, too, run three times better.

Same floor space is used and only one more girl has been added. Yet, the frank line is turning out more than 40,000 lb./wk. compared with a previous high of about 14,000 lb./wk. Key to the jump is the high-speed, automatic Wrap-King packager (Crompton & Knowles, Holyoke, Mass.).

Officials credit the machine with these significant benefits:

- **Higher production capacity**–from former 11 lb./min. up to 35 lb./min.
- **Reduced labor cost** – formerly \$5.47/100 lb., now down to \$3.05/100 lb. (little more than 3¢/lb.).
- **Lower packaging film cost**–from \$2.51/100 lb. on pre-cut film down to \$1.88/100 lb. of roll stock.

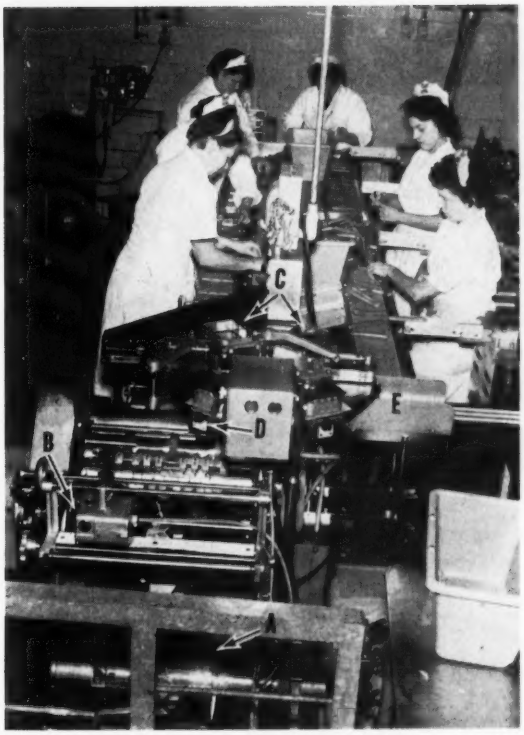
How does the machine increase sales? Krauss reports that the big volume increase enables better performance on shipping order dates. Also, reduced costs permit meeting competitors' prices.

Since Krauss first began using advanced packager, 5 new salesmen have been added to the original 10-man staff. In fact, only space limitations now keep the company from producing and selling more.

Included with the packager in the complete line setup are four automatic peelers that strip original cellophane from each smoked frank and a conveyor belt-table at which several girls hand-pick franks and pile them 5 or 10 to a card.

Two girls operate peelers. Strings of $5\frac{3}{8}$ in. long franks, brought from chillroom as needed, are passed through these strippers onto a revolving conveyor which parallels the wrapper-sealer's infeed, to which Krauss has added a 6-ft. extension to allow more personnel to load franks. A third girl removes film from "skippers" (franks that passed through peeler but did not lose cellophane).

FRANKS are stacked in two rows of five. Girls average 35-pkg./min. of 1-lb. franks. Krauss turns out over 40,000 lb./wk. for the metropolitan N.Y.C. area.



ROLLED FILM (A) is stopped at desired length by electric eye (B). Rotating pockets (C) carry overwrapped packages over heat-sealer (D) and into chute (E) that delivers to boxing station.

At far end of conveyor, a feeder places cards ($3\frac{3}{8}$ x $5\frac{1}{8}$ in. and .024-in. thick) on succeeding conveyor stations. Cards are blank on one side and printed with brand name and heating and serving suggestions on reverse. Four girls place franks on cards, either 5 in one row or 10 in two rows. As stacked franks enter wrapper, bars on each side of line move in to straighten pack prior to covering with film, cutting chances of mis-packaging.

Cellophane (.003 LSAT) feeds automatically from a roll into machine and is stopped at desired length by an electric eye. Sheet is then cut and overwraps stacked franks now in position. Package is then raised into one of six rotating pockets and film is automatically folded beneath card.

Wrapped package passes over a sealer equipped with thermostatic heat control, carries around to an open pocket and onto a discharge belt, then drops down a chute to handboxing (12 pkg./carton).

Another girl inspects packages prior to boxing. Rejects may be occasioned by crooked wieners, some of which might have developed "noses" when strings of franks were racked for drying.

Machine can turn out up to 60 packages a minute. Krauss currently operates unit at 42/min., with girls actually averaging 35/min. Thus, several cards may move empty. These are removed by an automatic ejector prior to entering wrapper. Average time needed to turn out one package, from peeler to final carton, is 40 sec.

Big Step-Up

Previously, Krauss used a semi-automatic packager. Here, one girl operated only two peelers, while four others "diaper-wrapped" wieners in more expensive pre-cut film sheets, then stacked on cards, and sent along to next girl who heat-sealed each package by hand. With present machine, packages aren't touched following stacking until ready for cartoning.

Krauss uses the machine primarily for 10-frank, 1-lb. packages but occasionally produces 5-frank, $\frac{1}{2}$-lb. packages on same machine. Stacks of four and eight are also possible. Package sizes handled range from a maximum $6\frac{1}{4}$x$4\frac{1}{4}$x2 in. to a minimum of 4x3x$\frac{3}{8}$ in.

Unit is powered by $\frac{1}{2}$ hp. motor and weighs 1,800 lb. Card feeder can handle any shape card—thickness .020 in. up. Standard infeed conveyor has 12 flights for stacks and extra extensions are available. Machine is also equipped with a coding unit for date and pricing data.

John Krauss, president and general manager, praises the machine for "enabling us, in a limited space, to meet our competitors in price and shipping, and to reduce our labor and material costs for substantial savings."

Firm is one of the larger metropolitan packers, with 213 employees producing over 800,000 lb./wk. of fresh pork and smoked meats. Franks, which total 40,000 lb./wk., retail at 52¢/lb. —*End*

This little old woman, who lives in a shoe,
Buys lots of food, good thing it's true
That foods protected with

SORBISTAT®-K

Stay fresher longer...this easy way!

TODAY A WIDE RANGE OF FOODS get the benefits of "freshness protection" thanks to SORBISTAT-K (potassium sorbate, Pfizer). By effectively inhibiting mold and yeast growth, SORBISTAT-K keeps food fresher—and extends its shelf life!

These are some of the products where SORBISTAT-K has proven highly successful:

• fresh fruit cocktails • high moisture cake batter • cake fillings and icings • fruit pie fillings • cheeses • fountain fruit syrups • chocolate syrups • prepared salads • pickles • dietetic jams and jellies • smoked and pickled fish • wine • dried fruits.

SORBISTAT-K is readily soluble in water. You can prepare up to 40% solutions for sprays, dips and metering. It has little or no effect on the taste.

New Improved SORBISTAT For Dry Mix and Oil Solution—Pfizer now offers SORBISTAT (sorbic acid, Pfizer) for applications where water solubility is not a factor. This improved form has an extremely low moisture content.

SORBISTAT is a free-flowing product that dissolves readily in oil and fat media and can be mixed easily in dry form with other dry food ingredients. Complete technical data on both SORBISTAT-K and SORBISTAT will be sent on request. Write today.

Science for the world's well-being

CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N.Y.
Branch offices:
Clifton, N.J.; Chicago, Ill.;
San Francisco, Calif.;
Vernon, Calif.; Atlanta, Ga.;
Dallas, Texas;
Montreal, Can.

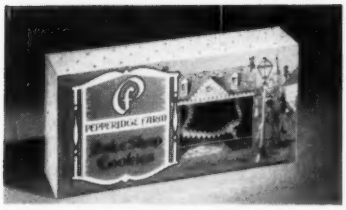
Packaging Awards—'60 Style

Food cartons take 16 awards for printing, merchandising, construction, and potential new volume use in Folding Paper Box Assn. contest

Double Winner

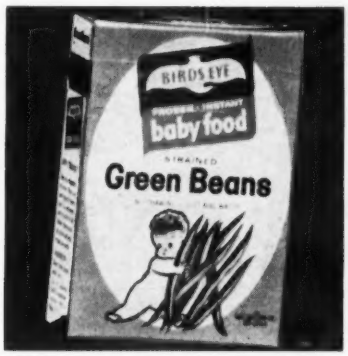
MOST OUTSTANDING were Armour's sausage packages, which won first awards for general mechandising and technical superiority of gravure printing. Foil and design was termed excellent.—*Chicago Carton Co., Chicago.*

Merchandising Merit



ATTRACTIVE DISPLAY of Pepperidge Farm Bake Shop Cookies received one of eight merchandising merit awards.—*Warner Bros., Bridgeport, Conn.*

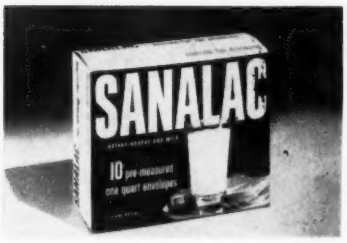
Two Showing Best Potential



FROZEN BABY FOODS, from General Foods, drew considerable interest, and thus a merit award. Birds Eye Div. is test-marketing 23 varieties.—*Container Corp. of America, Chicago.*

BOX-LIKE CARTON of Sliced Bacon from Dubuque Packing Co., while not new, received first award "in hope that other packers will switch from flat boards."—*St. Regis Paper Co., N.Y.C.*

TASTE-TEMPTING CONTAINER for Beatrice Foods' Mrs. Claus Ice Cream was sole confectionery-class winner.—*Chicago Carton Co., Chicago.*



SHARP IMPACT of simple design won recognition for carton of Sanalac Instant Nonfat Dry Milk.—*Diamond National Corp., Cincinnati.*

Construction Excellence

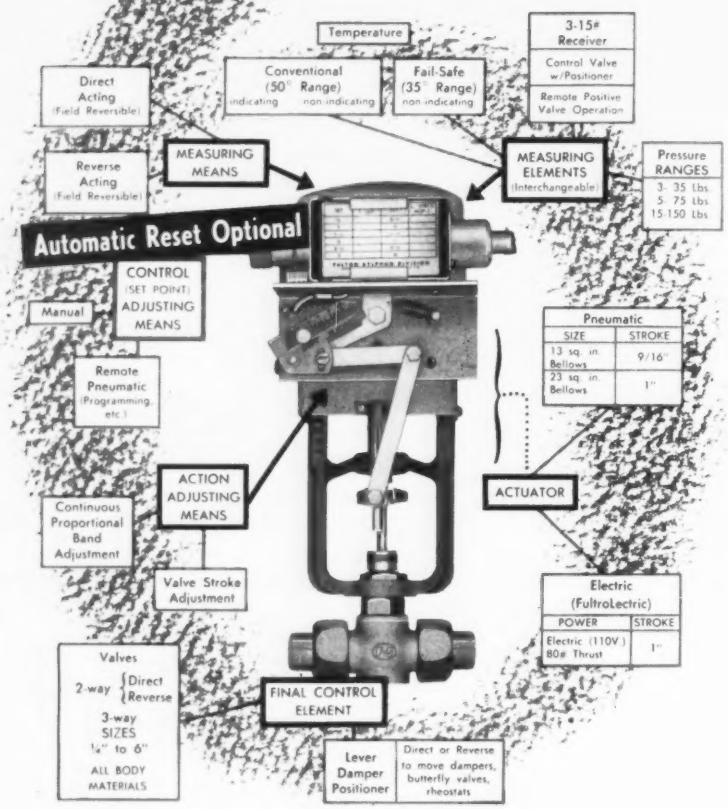
VISUAL APPEAL afforded by this ▶ window-type carton of Northland Farms Smoked Sliced Turkey Breast captured only award (merit) given a food package for superior construction.—*John Strange Carton Co., Menasha, Wis.*

Turn page for more Merchandising Merit winners

GREATEST FLEXIBILITY IN POWERED CONTROLLERS!

THE NEW FultroMatic® 3-IN-1

Controller·Positioner·Valve



Adding the precision performance of pneumatic control to the ruggedness and simplicity of our famous self-ops, the "one-package" FultroMatic gives positive control for process temperatures or pressures, with wide choice of ranges . . . at about half the cost of 2- and 3-unit systems. For complete data, write today for Bulletin GG-755. **Fulton Sylphon Division, Robertshaw-Fulton Controls Co., Knoxville 1, Tennessee.**

Robertshaw®

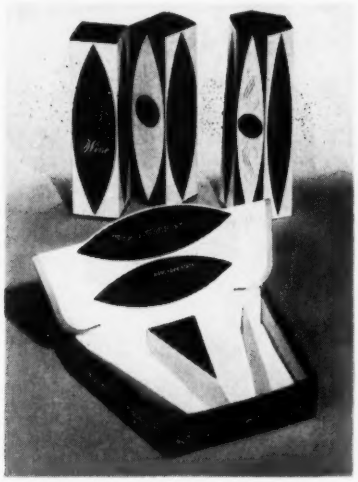
MR. CONTROLS

Merchandising Merit

REALISTIC DISPLAY of Gateway Farms Instant Whipped Potatoes meant realistic merchandising to judges.—*Continental Can Co., N.Y.C.*

HIGH-PROTEIN line of boil-in-bag dinners, with warm, hospitable designs, boosted stock of Armour's Hasty Hearth. —*Continental Can Co., N.Y.C.*

JUMBO-SIZE pretzels, called "Jetzels," from Bachman Bakeries, had strong visual and impulse appeal.—*Container Corp. of America, Chicago.*



BEVERAGE HONORS went to attractive, modern bottles of Gold Seal Wine and Champagne.—*Container Corp. of America, Chicago.*

CHRISTMAS MOTIF on Morrell Pride Canned Ham exemplified creative design for seasonal sales.—*Waldorf Paper Products Co., St. Paul, Minn.*

And 3 Printing Winners

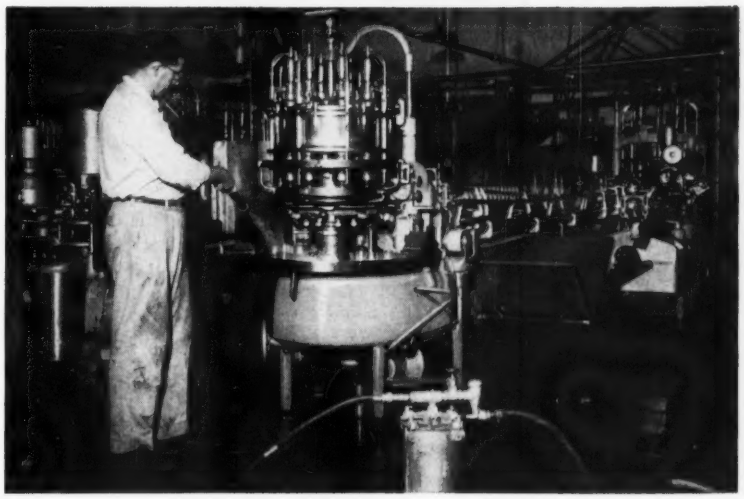
In addition to Armour's top-award sausage-package, three other food cartons reaped honors for technical superiority of printing.

A lithography first went to Dressel's Bakeries' Chocolate Pecan Fancies. Printer-boxmaker is **Waldorf Paper Products Co., St. Paul, Minn.**

Product color was standout feature of frozen Rose Royal Chocolate Cake, which received a merit award for lithography. The 4-color illustration is complemented by clean type matter on large solid areas. **Lord Baltimore Press of California, San Leandro,** designed and manufactured this winner.

An economical, yet attractive, 3-color Twin-Pack of Parrot Potato Chip Co.'s Polly Parrot chips took a first award for flexographic printing. Smoothness of color was termed outstanding. **B. F. Nelson Mfg. Co., Minneapolis,** supplied carton.

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite



New General Cleaner! Oakite LIQUI-DET® No. 2 banishes toughest food soils

Cooked on or dried on chocolate, egg, milk, syrups . . . try it on the toughest food soil you can, and see how new Oakite Liqui-Det No. 2 wets through it with ease. What's more, Liqui-Det No. 2 produces good suds for vigorous cleaning action . . . rinses thoroughly with no trace of film or water spotting . . . contains no odor-producing solvents . . . is safe for any food-contact surface.

Just mix an economical ½ to 2 ozs. in a gallon of water; wipe, mop or spray it on; mop, wipe or hose it off. Surfaces sparkle. Stainless steel, especially, looks *newer* after each washing.

Liqui-Det No. 2 is the latest general cleaner for food preparation areas. And it's the best yet. Try it!

THE BIG PLUS IN OAKITE

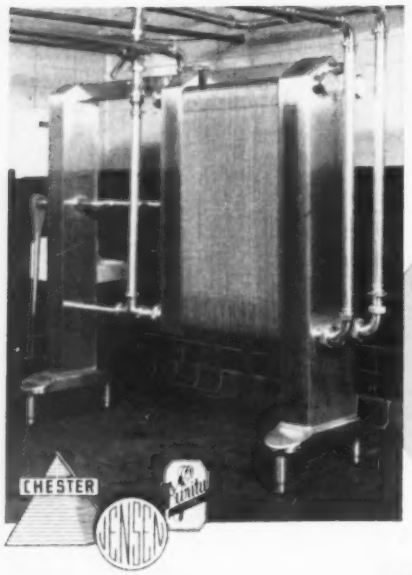
Ask the Oakite man to demonstrate Liqui-Det No. 2 in your plant. Working with him is like adding a consulting sanitation engineer to your staff. It gives you the latest research results in cleaning. It means an end to costly waste of time and materials. It brings mechanization to tedious chores. It *guarantees* materials that do the job. Send for Bulletin B-8165, which tells more. Oakite Products, Inc., 26G Rector Street, New York 6, N.Y.

OAKITE

over 50 Est. 1909 SCIENCE

years' leadership in industrial cleaning

This CHESTER-JENSEN PLATE HEAT EXCHANGER



HEATS
A Viscous Liquid
From 40° F.
To 140° F.

. . . . and
COOLS
It From 180° F.
To 76° F.
Solely by Regeneration

. . . . Without Cost for Steam or Coolant

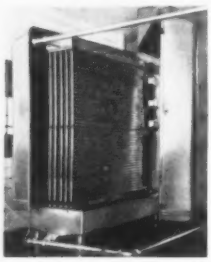
The Plate Heat Exchanger shown above as operated saves approximately 70% of the normal cost of heating and cooling a viscous liquid over a total temperature range of 40° F. — 180° F. — 32° F. In most services, appreciably higher savings are easily possible.

Required supplementary heating in this installation is accomplished at low cost by a Ste-Vac type Chester-Jensen Shell-and-Tube Heater, designed for applications requiring dependably uniform distribution of heat over the tubes.

Cooling from regenerative temperature to 32° F. is effected by a Chester-Jensen "Beaudelot" Fan type Cooler, using ammonia as the coolant.

In most instances all these services could be performed by a single Plate Heat Exchanger having, in addition to its regenerative section, another for supplementary heating and a third for final cooling.

The several types of Chester-Jensen stainless steel heating and cooling equipment are designed to work together or separately in order to provide — always — the best possible answer to specific, and often difficult, problems. To this end, we shall be glad to study *your* problem — without obligation.



Fan Type "Beaudelot" Cooler, above, is one of five similar units built by Chester-Jensen for low temperature cooling of almost any liquid.

Hermetically enclosed Vat, above, is equipped for heating, cooling, mixing, vacuum treatment, pressure discharge. Numerous other types of vats and heat exchangers are available.

CHESTER-JENSEN COMPANY, Inc. 347 Tilghman St. (Dept. S) CHESTER, PA.

Specialists in Stainless Steel Industrial and Food Equipment

12 Conveniences That Women Want In Food Packages

Shoppers emphasize handier sizing, easier opening, simpler use

A DOZEN pointed suggestions from shoppers were specially spotlighted when the Food Packaging Council's recent Chicago symposium targeted container-design aims.

Said Catherine McAndrews of Super Market Institute: "Food men still appear to believe that women are most impressed with beauty of packages. But the women keep telling the industry that package convenience is most important to them."

Here are 12 convenience suggestions that they accent:

1. Scale more packages for needs of the 6-million-plus single-person households. Example: Utilize two portions of frozen vegetables within a package, making it easy to separate them and store second portion.

2. Reduce package size for some 14 million two-person households. They're forced to buy eight burger or frank buns, when all they need is half that number. Generally, too, loaves of bread are too big for them.

3. Unitize small-portion cereal packages in single varieties, instead of several. Trouble with multi-variety packs is inclusion of unwanted kinds.

4. Improve egg cartons—maybe with a sliding tray, or tabs to raise eggs from pockets.

5. Give more information on shelf-life of packaged perishables—such as clarifying how long frozen foods will keep in refrigerator.

6. Include a vertical transparent insert in milk cartons to show amount of product remaining.

7. Package lard in quarters (like butter and margarine).

8. Clarify wording on deal packages to show just how much money is saved.

9. Pack brown sugar in moisture-proof containers to curb product's hardening.

10. Substitute a re-closable package for film packs of cookies. Same thing for noodles, dried beans, etc., packed in transparent bags.

11. Make film packs of sliced cheese easier to open.

12. Introduce new products in smaller, less costly sizes. Women shy from expensive try-out purchases.

—*End*

B.F.Goodrich conveyor belting and hose meet FDA's new requirements for safe food handling

Company is first in the rubber industry to have its products found suitable by the Food and Drug Administration for food-handling service

FOR over a year now, a task force of B.F.Goodrich scientists and technicians has been conducting thousands of experiments in the area of food additives. Its mission: to evaluate the company's rubber products subject to the new food additive amendment effective March 6.

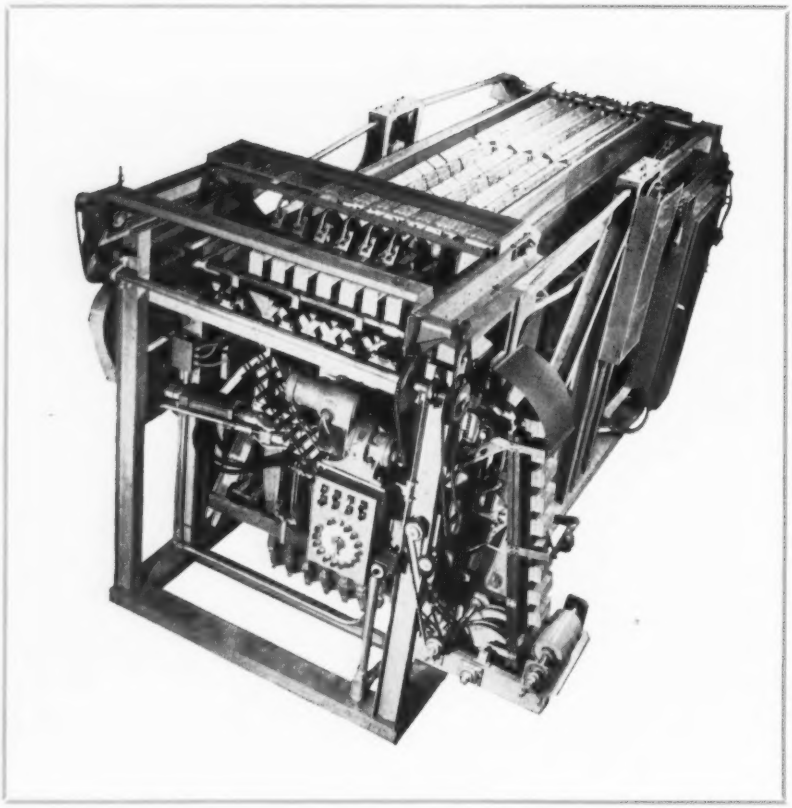
The result is that B.F.Goodrich is the first company in the rubber industry to have products found suitable by FDA for use in food processing operations. These products include conveyor belts for carrying dry, aqueous and fatty foods, brewery hose and milking-machine inflations.

The FDA must be satisfied that ingredients used in the manufacture of rubber and vinyl products do not contaminate the food they contact. The exhaustive tests by B.F.Goodrich have not only qualified materials used for years in B.F.Goodrich products, but have also established as acceptable some new materials which do a better job than those previously used.

The time and effort put into this evaluation and testing program is another example of how B.F.Goodrich goes all out to solve a problem—whether it's for a single customer or, as in this case, an entire industry. For more information on any of these improved products, developed for the safe handling of food, call your B.F.Goodrich distributor, or write *B.F.Goodrich Industrial Products Co., Dept. M-823, Akron 18, Ohio.*

B.F.Goodrich

CIRCLE 65 ON READER SERVICE CARD



UNIT IS PORTABLE and installed in uninsulated room where maintenance can easily be performed.

New Vertical-Plate Freezer

Rectangular tube assemblies hasten refrigerant gas removal . . . Package position reduces insulation from head space . . . Higher pressure assures maximum heat transfer

JUST UNVEILED, following an extended "shake-down" period, is a radically new food freezer that employs vertical plates between which the packages move downward intermittently. Then frozen products are discharged from bottom of unit and automatically conveyed to wrappers or case packers.

ARTHUR V. GEMMILL
Senior Associate Editor, "Food Engineering"

This unit is presently operating at the Costa Ice Cream Co. plant in Woodbridge, N. J.

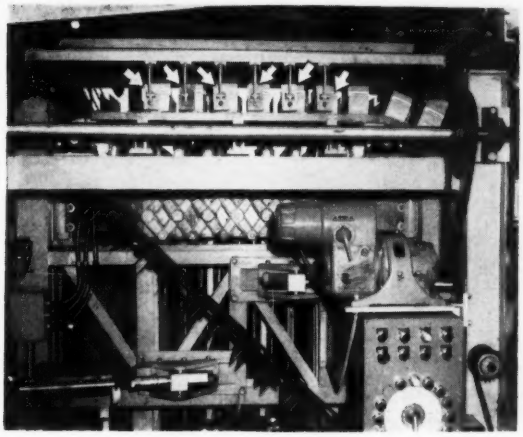
It's used by this firm for freezing ½-gal. rectangular packages of ice cream at a rate of approximately 800 gph.

It's also adaptable to freezing such other foods as fish, meats, fruits and vegetables packed in rigid containers.

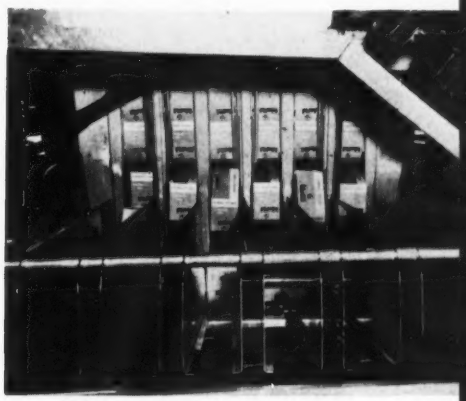
Called the Cyclomatic vertical plate freezer, the machine provides these benefits–

► 1. It needs no insulated enclosure

FILLED PACKAGES are positioned at end of unit, then pushers (arrows) move them into "ready rails" above the 6 freezing channels. Note dividers on conveyor chain (diagonal to machine) that accurately position cartons.



WHEN "RAILS" ARE FILLED, freezing plates open and entire layer of packages is lowered into freezing zone.



ELEVATORS below freezing channels have belts that convey packages from machine. They drop into channels . . .

. . . then pushers move them, onto take-away conveyor.

Steps Up Performance

—at Costa it's installed in a truck bay adjacent to plant's processing room.

▶ 2. Its gravity-feed, full flooded system insures maximum heat transfer between plates and products.

▶ 3. Vertical position of packages during freezing, with headspace at top, minimizes insulation due to air.

▶ 4. Freezing is faster due to more intimate contact between plates and cartons brought about by uniform application of hydraulic pressure to the planiform plates.

▶ 5. Since refrigerant is completely drained daily, regular removal of entrapped oil is possible. This should increase operating efficiency of freezer, and of plant's entire refrigeration system.

Unit comprises 7 parallel freezing plates 168 in. long by 65 in. high. These provide 6 channels of equal dimensions in which products are frozen.

Each plate is made up of 56 individual, open-end rectangular tubes 2x2x65 in. long, welded together. A horizontal 2x3 in. tube is welded to bottom of plate to form a liquid header from which ammonia is uniformly fed into each of the vertical tubes.

Another header (2x5 in.) is welded

to top of plate. Through it the NH_3 gas formed in the individual tubes is quickly removed and piped to an accumulator. Liquid level in tubes is controlled by a float valve.

How Freezer Operates

Packages are conveyed continuously from filler to an elevator at end of Cyclomatic, which raises them to top of machine and aligns them with the 6 "ready-rails" above freezing channels. When 6 packages are aligned, a pusher bar with six individual shoes moves them into rails, then retracts until another group is assembled.

When a complete top layer is formed, freezer plates open and elevators (one under each channel) raise entire load of packages and pick up top layer from rails. Elevators then retract until bottom layer of packages is below freezing plates and top layer has moved into freezing channels. Then plates close, and unit resumes freezing operations.

Elapsed time between opening and closing of plates is less than 5 sec.—allowing no time for frost to build up on their surfaces. And the two outer plates are insulated to protect their unused surfaces.

Upward movement of elevators loosens any packages that may have frozen to plates. And when plates close, a cross-shear mechanism separates bottom layer from the one remaining in the freezer. Then belts in top of elevators discharge the frozen packages to a conveyor that feeds bundling or casing equipment.

In the case of ½-gal. rectangular packages, there are 13 layers in each channel—a total of 1,872 cartons in the freezer at one time. Residence is slightly over 65 min. If desired, this could be shortened and capacity of machine increased by lowering temperature of refrigerant in plates.

For smaller packages of foods, holding capacity is greatly increased. Actual freezing capacity will, of course, vary with product, its incoming temperature, and desired discharge temperature. Estimated freezing capacity of machine is approximately 5,000 lb./hr.

The maker of the unit (Cyclomatic Freezing Systems, Devon, Pa.) has also developed a portable simulator which accurately measures capacity of the large machine (see accompanying illustration). This makes possible small trial runs on various products and packages, which quickly tell what can be expected of the larger unit without the expense of installing one.

In the Costa operation, the ½-gal. containers are automatically filled on an Anderson machine in the plant freezing room. Ice cream is fed to this filler directly from a 3-barrel CP continuous freezer, making possible production of 1-, 2-, or 3-flavor combinations.

Filled packages are conveyed to the Cyclomatic continuously (through an opening in a Plexiglas partition between freezing room and truck bay). It takes approximately 5-min. to accumulate a full layer of packages on the "ready rails."

As they are discharged from bottom of unit, the frozen packages are conveyed to a Hayssen wrapper, where they are assembled in gallon lots and over-wrapped in kraft paper.

The sealed packages may be conveyed either directly into a refrigerated trailer for immediate delivery, or to the ice cream hardening room for later distribution to dealer outlets.

New unit is not sold. Instead, it is installed on a lease basis. —*End*

Portable Simulator Helps Prospect Decide

Before installing the plant-size Cyclomatic, a prospect can obtain much useful information from this portable simulator.

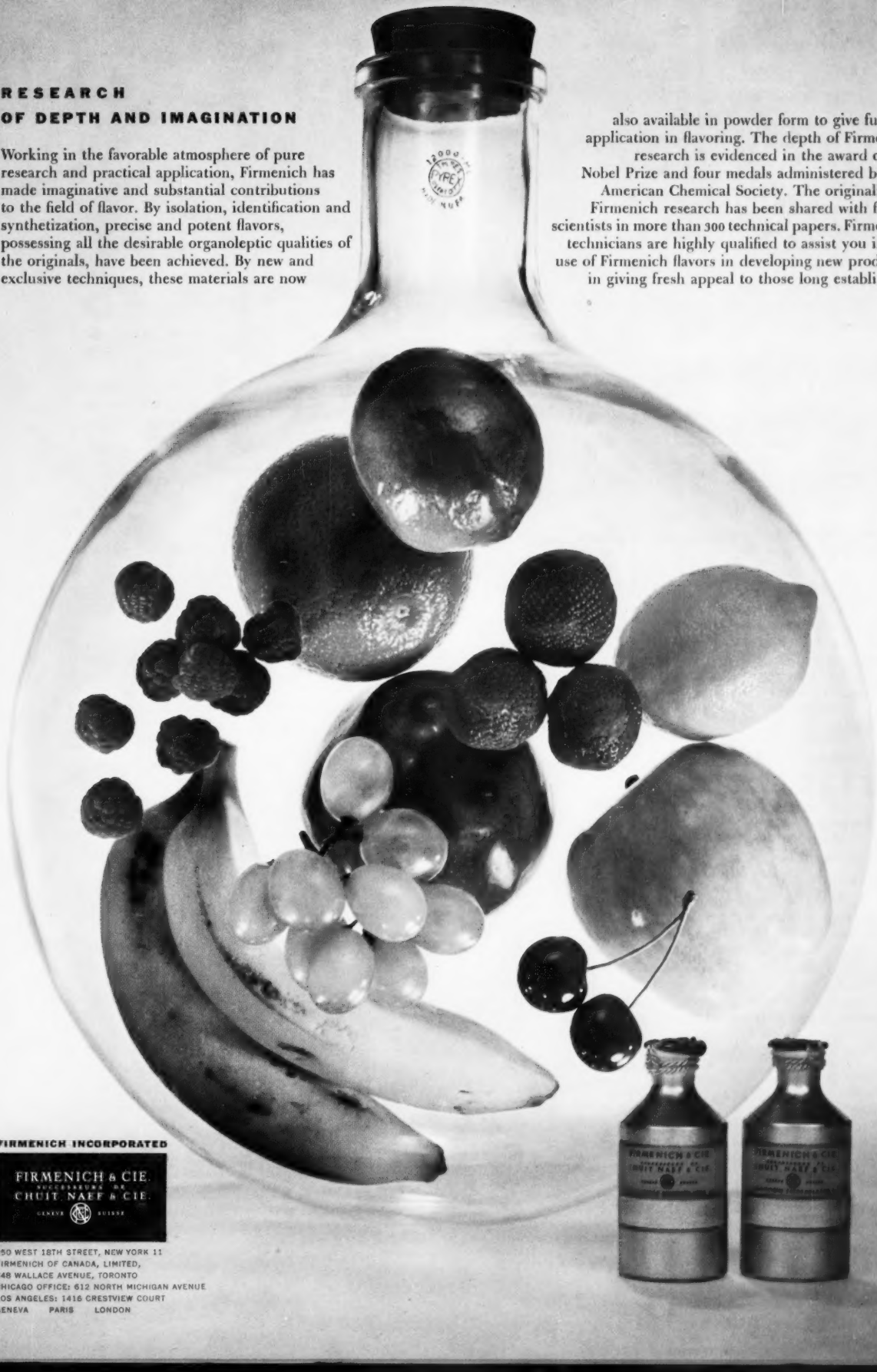
Thermocouple tests can be run right in prospect's plant, bringing products to desired discharge temperature. This establishes anticipated rate of production on large-size unit, and enables operating costs to be calculated.

Further, physical appearance of package and its content can be appraised. And through lab-type tests, quality of products frozen can be compared with performance of present methods.

CIRCLE 69 READER SERVICE CARD→

RESEARCH
OF DEPTH AND IMAGINATION

Working in the favorable atmosphere of pure research and practical application, Firmenich has made imaginative and substantial contributions to the field of flavor. By isolation, identification and synthetization, precise and potent flavors, possessing all the desirable organoleptic qualities of the originals, have been achieved. By new and exclusive techniques, these materials are now also available in powder form to give further application in flavoring. The depth of Firmenich research is evidenced in the award of the Nobel Prize and four medals administered by the American Chemical Society. The originality of Firmenich research has been shared with fellow scientists in more than 300 technical papers. Firmenich technicians are highly qualified to assist you in the use of Firmenich flavors in developing new products, in giving fresh appeal to those long established.



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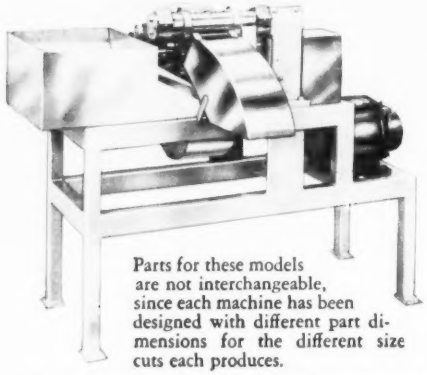
Models F, G, H *and* GK ...

are 4 *Separate Cutting Units!*

They all look alike...all operate alike



Parts for these models are not interchangeable, since each machine has been designed with different part dimensions for the different size cuts each produces.

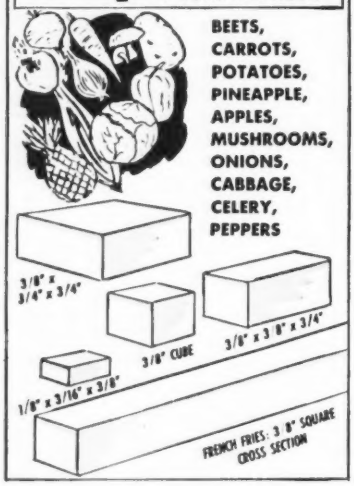
...but each produces a different range of cut sizes!

The product to be diced is fed first to the inside of a slicing shell, where it is then rotated by an impeller at high speed. Centrifugal force causes product to slide around the inside surface of slicing shell. As product approaches top of this shell it slides over an adjustable slicing gate which controls slice thickness. Slicing knife is at top of slicing shell. At the instant of slice, cross cut knives ride down, cutting slice crosswise into strips, or french fry cuts. These knives throw the product into the revolving circular knives that cut the strips into cubes.

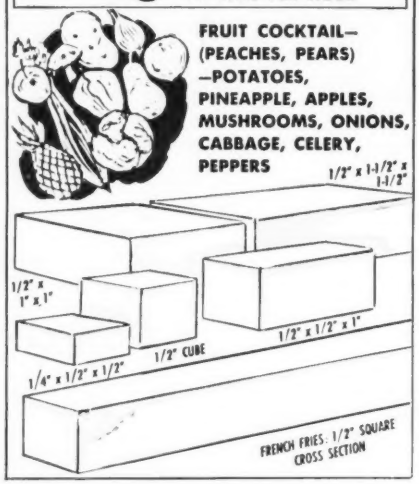
This new cutting principle has many advantages over previous methods. When slicing any product with a knife, the product tends to crack parallel with the knife's edge, particularly in brittle, root vegetables. Product cracking is overcome by **cutting parallel with the strains set up,** thus eliminating strains and the resultant cracking.

Product damage is eliminated by moving the product in a straight line from the time the first cut is made until the last cut is made, which reduces impact and crushing, and makes possible the high operating speed and quality of cut produced.

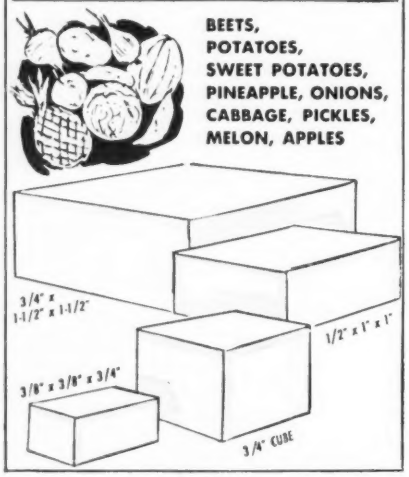
MODEL F — CUTS UP TO 9 TONS PER HOUR


BEETS, CARROTS, POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
3/8" x 3/4" x 3/4"
3/8" CUBE
3/8" x 3 8" x 3/4"
1/8" x 3/16" x 3/8"
FRENCH FRIES: 3 8" SQUARE CROSS SECTION

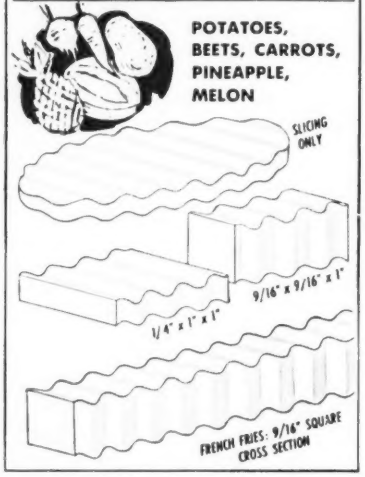
MODEL G — CUTS UP TO 11 TONS PER HOUR


FRUIT COCKTAIL— (PEACHES, PEARS) —POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
1/2" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
1/2" CUBE
1/2" x 1/2" x 1"
1/4" x 1/2" x 1/2"
FRENCH FRIES: 1/2" SQUARE CROSS SECTION

MODEL H — CUTS UP TO 15 TONS PER HOUR



MODEL GK — CUTS UP TO 10 TONS PER HOUR

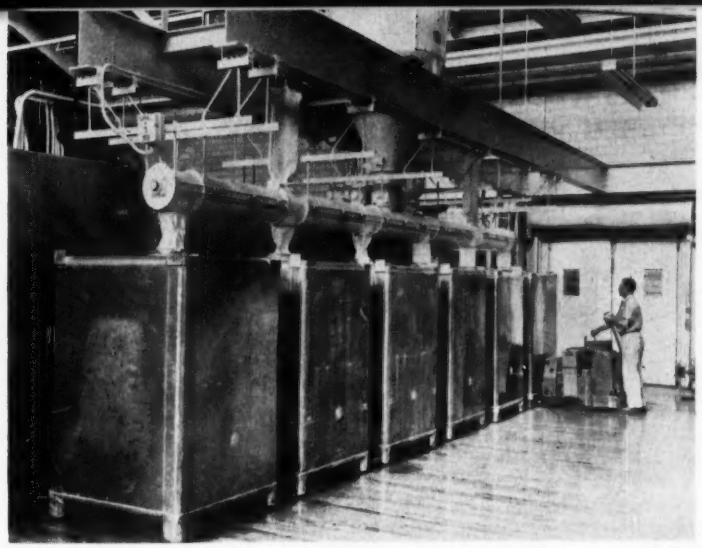


PRECISION HIGH SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products

AUTOMATIC CONTROL PANEL decides which of three double tilt stations will discharge flour in quantities desired.



BIN-FILLING is automatic. Incoming flour is carried along screw conveyor to nylon sleeves feeding into Tote Bins. After first bin is filled, flour is diverted to succeeding units. And when last bin is filled, screw reverses. Sleeve acts as shut-off valve when bin is not in place.

Bulk Automation Pays Big

With speedy, electronically controlled portable bin system, Nabisco moves up to 43,000 lb. of flour daily in Denver bakery operations

SHARPER QUALITY CONTROL at less cost—that's the reward of automation in bulk flour handling at the Denver plant of National Biscuit Co.

Modern Airslide railroad cars, pushbutton control panels, Tote Bins (total 155), and automatic filling and discharge stations comprise the advanced operation that handles up to 43,000 lb. of flour daily in the manufacture of soda and graham crackers, cakes, and cookies.

New system, which replaces manual bag handling, is credited with saving . . .

- **Flour** – cutting losses formerly caused by bag spillage and residues.
- **Labor**–conserving costs of two men who handled bagged flour in old routine.
- **Time**–through quicker, more exact product formulations.

Moreover, Nabisco is able to assure higher sanitation efficiency, and better quality control.

Here's the "how" of the system: Bi-weekly, five 100,000-lb.-capacity Airslide cars arrive at the bakery siding from Washington and Missouri. Flour remains completely uncontaminated by dirt or moisture as it is "fluidized" from car hoppers and pneumatically conveyed to an inplant screw conveyor for filling.

Beneath the screw, attached by nylon sleeves, are six 2,800-lb.-capacity Tote Bins. As fillling begins, lights on a control panel indicate direction of flour flow. When a bin is filled, flour flow is automatically diverted to next container in line until last bin is filled, whereupon screw reverses. A stop button allows for purging time to assure screw is free of flour.

Standard fork-lifts store filled bins and bring new empty ones under sleeve. Interchange takes less than 10 min.

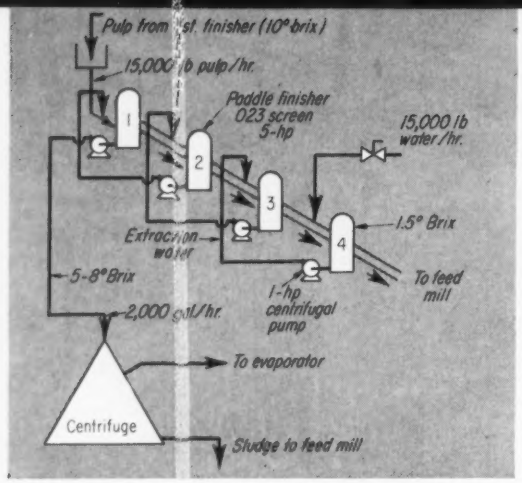
Automatic Discharge

From double-tiered storage area, filled bins are fork-lifted to panel-controlled discharge station, consisting of three Tote System double-tilt units, each handling discharge of a different type of flour–strong, medium-soft, or soft. Mercury diversion valves at each tilt station provide automatic switching from one bin to the next, allowing uninterrupted interchange of bins. Electronic devices called "Tektors" indicate when a bin is empty and should be removed.

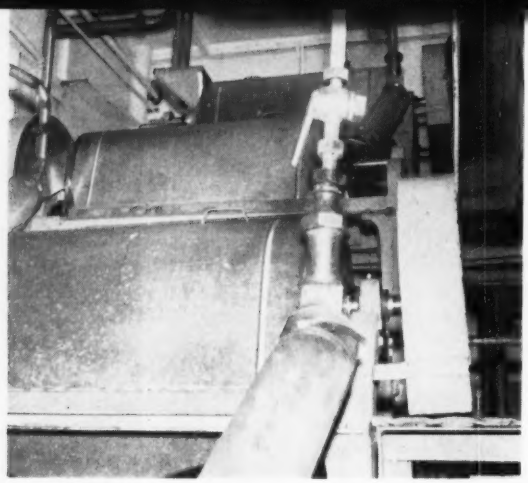
Bins are tilted 45 deg. for discharge of flour to rotary feeder and blower. Thence, it continues to an air separator for processing, and movement to gyro sifter and scale hoppers. When hoppers have received proper weight, system shuts off automatically.

In some Nabisco operations, bins serve interplant and between miller and bakery.

Thus, versatile Tote units perform three services–as shipping containers, storage units, and discharge hoppers. —*End*



COST SAVING pulp washing system uses fresh water in counter-current flow to extract valuable solids from orange pulp. Extraction water is centrifuged.



PULP-WASHING finishers, three of a battery of four arranged cascade fashion for gravity flow. Finishers are paddle type used to pulp tomatoes.

Centrifuge Cost Down, Quality Up

In new and sophisticated applications, Florida citrus processors solve problems with latest high-capacity, continuous, desludging separators

SOPHISTICATED applications of centrifuges are improving quality and yield in food processing—and boosting process efficiency.

Several such applications recently have been made in the Florida citrus plants, with still more in the idea stage. And significant improvement in centrifuge design and performance have come with this progress.

Biggest new achievement of centrifuges is the separation of several undesirable constituents from pulp wash water. Doing this continuous, high-volume work are 30- and 40-hp. machines that handle up to 6,000 gal. per hour and automatically discharge accumulated sludge every minute in around-the-clock operation.

And additional sanitary features permitting the citrus sludge to be used for food purposes—such as a beverage base—have been built into one machine recently.

Many Problems Solved

There are many less spectacular, but none the less important, uses in the citrus industry. Pink grapefruit juice is being decolored to permit as much as 40% of this lower cost material to be blended with white grapefruit juice. The final product qualifies as Grade A, and is considered by some to have a superior flavor.

Depinking is possible because part of the pink coloration is in the pulp. And the centrifuge reduces the amount of pulp.

Flavor of white grapefruit juice can be improved, too, recent research indicates. Centrifuging takes out some undesired bitterness by removing a portion of the pulp. The result is a mild-flavored white juice for single-strength canning.

Important, too, are the benefits of centrifuging grapefruit juice that is to be concentrated. The clarifier not only improves flavor by taking out bitter pulp, but it ups yield appreciably by permitting juice from the second finisher to be fed to the evaporator instead of wasted (see diagram).

With tangerines, a somewhat different problem is solved. In the single-strength juice, USDA standards allow only 6% pulp. Yet a large amount of pulp appears in the extracted juice because of softness of pulp and peel. Here the centrifuge pays off by keeping pulp at the desired proportion.

When tangerine juice is to be evaporated, some pulp must be removed to avoid too high a viscosity in the evaporator before the desired Brix is achieved.

Lemon growing is making a fast comeback in Florida for the production of concentrate. Florida varieties are larger and are cheaper than California lemons as a source of juice for processing. Here again, the centrifuge comes into play to avoid undesirable bitterness and up yield. It is permissible to operate the juice finishers "tighter" for yield and still maintain control over the amount of bitter elements if the juice is centrifuged. Viscosity in the evaporators is beneficially reduced, too. Lime juice is centrifuged for similar reasons.

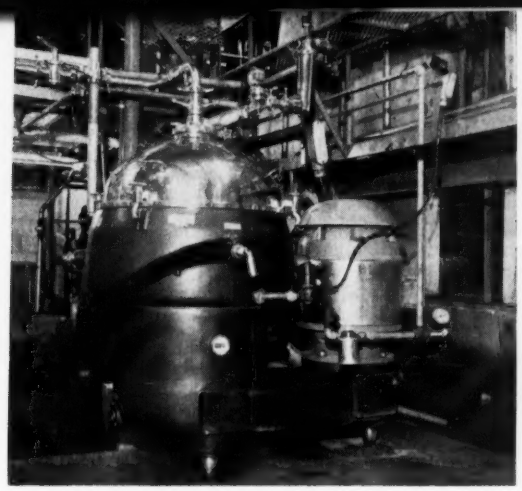
Centrifuges are used extensively, of course, for recovering citrus oils.

Because of the magnitude and variety of benefits, centrifuges are paying off capital invested in them faster in the citrus field than in many other branches of the food industry.

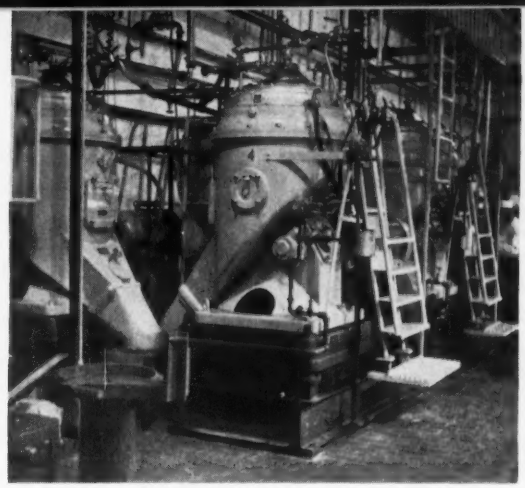
Pulp Washing Pays Off

Being the biggest volume application, the use of centrifuges in processing orange juice is especially significant. To get higher yields after the freeze in the 1957-58 season,

FRANK K. LAWLER
Editor, "Food Engineering"



"BIG SAM" desludging centrifuge at Plymouth Citrus Coop. controls solids content of citrus juices and depinks grapefruit juice. In other plants, unit handles pulp wash.



FOUR HUGE TITAN centrifuges at Pasco remove pulp and non-water-soluble solids from extraction water used in pulp washing. Each handles up to 4,000 gal. per hr.

Florida processors introduced the pulp washing technique. This involves water extraction of solubles from pulp removed from the raw juice ahead of the evaporator to control pulp content. Various pulp washing systems are listed in Table I. But the most common one involves flowing watered pulp by gravity through a series of six finishers in cascade fashion, the ratio of water to pulp being 1 to 1 on a weight basis. Some use condensed vapor from evaporators—which is part of the fruit—instead of fresh water.

For extraction efficiency, the water flows countercurrent to the pulp, being pumped uphill from one finisher to the next (see diagram).

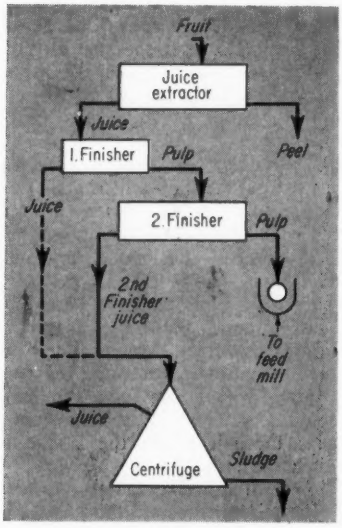
This system is simple, conserves space, and is fast enough to avoid undue bacterial buildup in the high pH wash. It is considered by users as a happy compromise of performance factors (see Table II).

There is no doubt that pulp washing increases yield. And in the highly competitive citrus business, it has become an economic must. Yet some technologists in the industry believe that the quality of the concentrate would be slightly, but not significantly, better without it.

And currently the industry is concerned about an FDA move to require the label declaration: "prepared in part from water extract of orange pulp."

Citrus researchers have this to say: "Apparently equipment and procedures are available with which fruit solids can be satisfactorily recovered from orange pulp . . . some of the water extracts examined were products with such characteristics that no reason was evident from data available at this time for not using them in the production of orange concentrate."

This approval, however, is given with reservations: "If the extraction

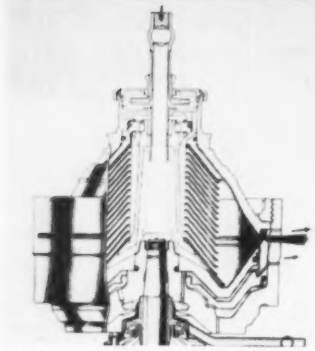


TO AVOID WASTE of white grapefruit juice from second finisher, juice is passed through desludging centrifuge to eliminate undesirable pulp and bitterness.

Table I—Processes Used for Water Extraction of Orange Pulp in Some Commercial Plants in 1958-59 Season. (Florida Citrus Experiment Station)

Plant No.	Code Used in Tables[1]	Extraction Process	Soluble Solids—Deg. Brix in Pulp: Before Extraction	Soluble Solids—Deg. Brix in Pulp: After Extraction	In Water Extract
1	CF	Countercurrent flow through finishers	10.4	4.4	Note[2]
2	CFC*	Countercurrent flow through finishers and extract centrifuged	11.0	3.4	6.1
3	CFC*	Countercurrent flow through finishers and extract centrifuged	11.2	3.6	6.2
4	CFRC*	Countercurrent flow through finishers, extracts recycled and final extract centrifuged	11.0	3.6	7.2
5	CFR	Countercurrent flow through finishers and extract recycled	10.4	5.2	8.0
6	CS	Countercurrent flow through rotating screen	10.8	7.4	7.3
7	SFR	Rotating screen and finisher used in double juice finishing operation; water added after rotating screen and extract recycled	10.8	5.8	7.0
8	WDF	Water added after first finisher in double juice fihishing operation	11.0	8.2	6.2
9	NO	Not observed	Note[2]	3.6	7.4

(1) C=countercurrent flow of water; and C*=centrifuge used. (2) Sample not obtained.



HOW DESLUDGING centrifuge works. Pulp collects in space at periphery (black area). Then it discharges through slots in bowl after "piston" of bowl is lowered by hydraulic pressure to create opening. (Courtesy Centrico, Inc.)

process is not carried out rapidly and under sanitary conditions, unsatisfactory extracts of poor quality will result."

We quote from a technical paper, *Water Extraction of Fruit Solids from Orange Pulp*, by F. W. Wenzel, R. L. Huggart, and R. W. Olsen, Florida Citrus Experiment Station.

Where does the centrifuge come into the pulp washing picture? At first it didn't. Then some processors ran into a bit of trouble. Viscosity of the juice (with pulp extract added) went too high in the evaporators. There were too much pulp and other undesirable substances in the extract water.

So most plants are centrifuging the pulp wash before feeding it to evaporators with the juice. According to Al Distelkamp, a German centrifuge engineer who has made several Westfalia installations in Florida, the centrifuge removes 50% of the pulp, eliminates the viscosity problem to allow longer and better evaporator operation, cuts bacteria count of the product and reduces pectinesterase. Bacterial and pectinesterase reduction is attributed to elimination of half the pulp.

Here's what Wenzel, Olsen and Huggart say about it: Use of centrifuges "resulted in a large decrease in the pulp, water insoluble solids, pectinesterase activity, and in both the oxalate-soluble and sodium-hydroxide-soluble pectins" (see Table II).

Need for pulp washing varies with fruit quality during the season. And it is most beneficial at midseason. But at any time it avoids operating the finishers so tight (for yield) that undesirable parts of the fruit go into the juice.

Widely used to remove pulp from juice and pulp wash water are paddle and screw pulpers (or finishers). These are about 3 ft. long and are equipped with 023 screens.

Viscosity control via pulp reduction is essential in producing 68-Brix citrus juice for the British, as well as the 72-Brix pineapple juice concentrate made in Mexico. At such high concentrations, the juices are self-preserving. But without viscosity control, the evaporators would not operate efficiently, and solids build-up on evaporating surfaces would be so rapid as to incur excessive downtime for cleaning.

Desludgers Do Big Job

Westfalia reports that it has 40 centrifuge installations in Florida citrus plants, 15 of these being the "Big Sam", with 40-hp. drive and up to 6,000 gal. per hr. throughput. Westfalia redesigned its big machine to handle the once-a-minute desludging cycle. And it has developed a "Sanitary Sam" that now is in operation at Minute Maid and other plants.

Big Titan desludging centrifuges also are used in pulp washing. Pasco has a battery of four, each handling 3,500 to 4,000 gal. per hr. In operation about 3 years, these Superjector models have a 6,000 gal. per hr. capacity. De Laval desludgers, too, are solving problems in several citrus plants.

Desludgers are similar to other centrifugal separators in that lighter liquid phases are forced upward through disk openings to outlets near the axis—the lighter the liquid the closer the outlet to the axis. But these units throw sludge into space around the outer periphery of the spinning bowl. Then at preset time-cycle intervals, the machines hydraulically force the "piston" of the bowl downward to open gaps through which the sludge is discharged.

According to Mr. Distelkamp, the Westfalia can operate months without cleaning—aside from flushing with water and CIP cleaning. Other equipment in a pulp washing line, however, is cleaned every 4 to 12 hr.

—*End*

Table II—Effects of Centrifuging on Characteristics of Water Extracts of Orange Pulp (Florida Citrus Experiment Station)

Characteristic	Values for Extracts Before and After Centrifuging						Juice & extract to evaporator
	Plant 2 CFC*[4]		Plant 3 CFC*		Plant 4 CFRC*[5]		Plant 2 CFC*
	Before	After	Before	After	Before	After	
Brix value[1]	6.2	6.1	6.2	6.2	7.0	7.2	11.0
Acid as citric[1]—%	0.34	0.32	0.38	0.39	0.45	0.45	0.72
Brix/acid ratio[1]	18.2	19.1	16.3	16.3	15.6	16.0	15.3
pH[1]	3.9	4.0	3.6	3.6	3.9	3.9	3.8
Ascorbic acid[1]—mg./100 ml.	22	21	20	21	22	22	37
Pulp—% by vol.[2]	11.5	7.5	6.0	3.0	13.0	6.5	9.5
Water-insoluble solids[2]—mg./100g.	182.4	29.6	110.4	39.6	304.4	0.4	148.4
Pectinesterase activity[2]	52.9	14.5	24.6	9.1	102.8	3.5	17.1
Flavonoids as hesperidin[2]—mg./100 ml.	124.8	121.9	94.3	94.3	150.6	134.8	85.8
Objectionable off-flavor	No	No	No	No	No	No	No
Cloud or turbidity[2]	55	52	59	52	57	45	43
Relative viscosity[3]	3.92	4.97	2.10	2.18	3.62	5.55	2.22
Water-soluble pectin[2]—mg./100g.	78.0	74.0	40.0	40.0	85.0	92.0	42.0
Oxalate-soluble pectin[2]—mg./100g.	22.0	5.0	13.0	5.0	53.0	1.5	14.0
Sodium hydroxide-soluble pectin[2]—mg./100g.	43.0	6.5	21.0	6.0	78.0	0.0	28.0
Total pectin[2]—mg./100g.	143.0	85.5	74.0	51.0	216.0	93.5	84.0

(1) Data obtained by R. L. Huggart and R. W. Barron; (2) by A. H. Rouse, C. D. Atkins and E. L. Moore; (3) by G. H. Ezell. (4) CFC,* counter-flow and centrifuging. (5) R, recycling.

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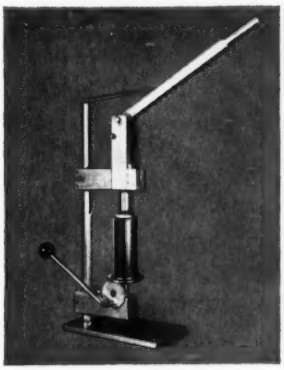
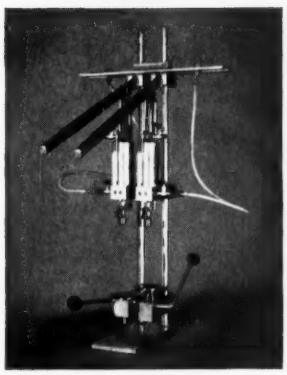


AND THIS Pressure Filler for injection of liquid propellant, a twin unit that lets you test any desired formulation of two propellants. (Rental $65 per month.)



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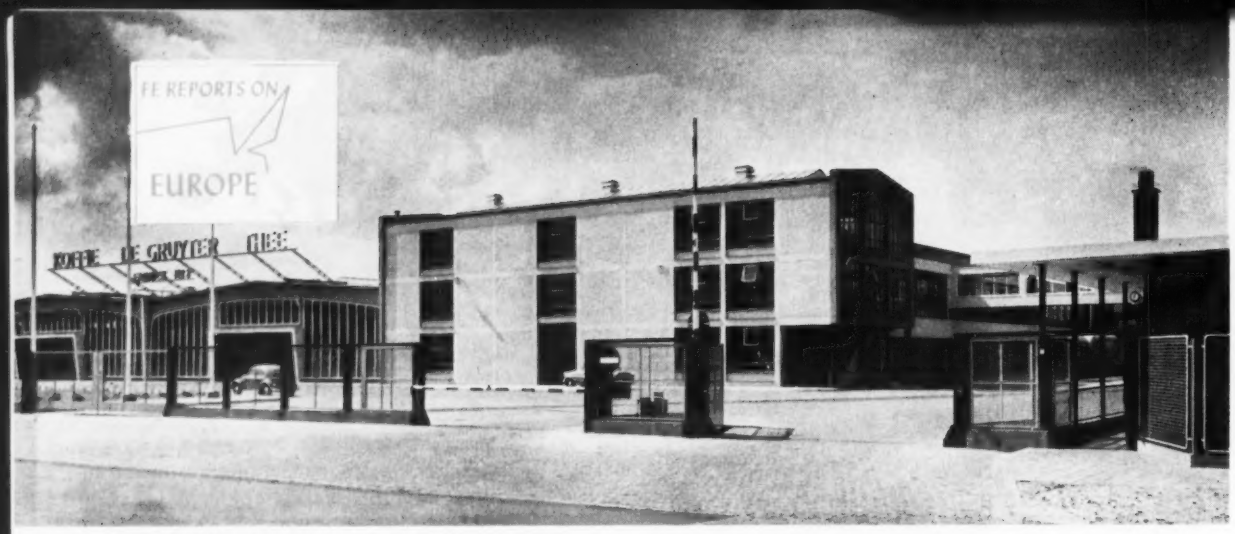

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"BETTER PRODUCTS—and 10% off—only at De Gruyter's!"

Adhered to since 1905, this slogan not only has become a household word in Holland, but it brings 450,000 housewives weekly to the 450 stores of the leading Dutch food processor-retailer.

The 10% off stems from cash payment, high volume, and outstandingly efficient processing and distribution by the 142-yr.-old Hertogenbosch firm.

"When you do everything yourself, only you are responsible for quality and price," is management's philosophy.

Ten engineers are on the payroll to keep manufacturing methods a step ahead. To help them they have a machine shop and a pilot plant with three stories of open space for flexibility and a crane to swing equipment into place. Quality-control technologists likewise have production control and research laboratories with gas chromatography and other modern analytical methods available.

Advanced engineering is paying off in ways both large and small under the direction of Hendrick Hege, plant manager and engineer. Here are some for instances:

Chocolate ingredients are automatically batch-weighed into a portable mixer. And this shuttles to the proper set of refining rolls and is dumped by a pneumatic cylinder.

Chocolate discharges from the rolls onto a steel belt conveyor, and is plowed off the belt into the conchers to be worked for 24 to 62 hr.

Continuously deposited into traveling metal molds, the chocolate is compacted by vibration and travels through a cooling tunnel. Plastic mold's were tried, but some of them cracked.

Regular chocolate bars are machine wrapped in foil and paper at a 140-per-min. clip. And 10 miniature bars, in two layers of five, are placed by machine on a corrugated tray and machine wrapped in cellophane with a tear-open strip.

High-speed, reliable Sig and Sapal packaging machines from Switzerland handle the chocolate packaging. But a Hesser (German) unit packages rice. It sets up the bags, and fills and seals them at 65 per min.

Ingenious Devices

A fine engineering hand also is seen in the macaroni operations. As the strands flow from a vertical extruder, they are picked up in groups by fingers on an endless chain. Simultaneously, a large revolving

FRANK K. LAWLER
Editor, "Food Engineering"

Management Makes Difference

Complimented by the visiting author on the efficiency of operations, Mr. Laure Gruyter made an interesting observation:

"The biggest difference between the food industries of Europe and the United States is in organization and management, not in processing and packaging methods."

He should know. He spent eight months studying operations in this country.

Could he also know whereof he speaks when he says that the taste of American foods is too flat?

toothed wheel catches the groups of strands higher up and pulls them against a cut-off knife. Now hanging double over the pick-off chain, the strands are transferred by a mechanical arm to a second pick-up arm that lowers the strands into moving-plate device that folds them once more to manageable length.

Sugar wafer batter is pumped and automatically deposited onto a continuous "waffle iron" oven conveyor. At the oven discharge end, a new German gadget automatically removes the baked wafer sheets. A mechanical arm taps the sheet and it slides between revolving brushes that move it onto a stack.

A conveyor carries the sheets under a filling depositor, top sheets are applied, the "sandwiches" travel through a cooling tunnel, then are automatically cut and packaged. Fruit, coffee, vanilla, and coconut fillers are used in the wafer sandwiches.

Unique Candy Process

Efficiency is engineered into the candy line, too. Sugar and starch are continuously fed into cooker by a pocket conveyor, and the right amount of water is supplied continuously by a piston pump. As it flows from the continuous cooker, the product is piston pumped into a batch continuous evaporator. The evaporator has two kettles so when one batch is finished, the kettle in operation automatically disengages from the evaporator head and the second kettle moves into position with its batch. Meanwhile, the first is dumped quickly and refilled. This unusual evaporator is a German development.

Pieces of hard candy are twist-wrapped at 250 per min. Bags are formed from roll material around a vertical tube, filled, and sealed at 60 per min.

Cookie dough is sheeted at rate of 5 tons per 8-hr. shift on three pairs of rolls. Then the dough is rotary cut and baked in four 140-ft. continuous ovens that are 31.5 in. wide Conveyed to floor below, cookies are mechanically arranged in rows, on edge, for machine wrapping at rate of 50 to 60 packages a minute. The Foxgrove (British) wrapper double-folds the cellophane along the side and wax seals the ends. This somewhat resembles National Biscuit's famously efficient soda cracker package.

To extract coffee to make instant, De Gruyter uses percolator cylinders that are very short, but are larger in diameter than those in the U.S. These are arranged in a circle.

HUGE OLD PLANT, a landmark in downtown Hertogenbosch, has modern equipment and engineering innovations.

Fast Handling

Materials handling at DeGruyter not only is modern overall, but involves innovations. An electrical power lift with forks, and a cab for the operator, raises and lowers unit loads three floors. Mounted in an open space on overhead rails, it moves forward, back, and sidewise as well as up and down, with loads up to 2,200 lb.

Large metal bins that are picked up and transported by trucks handle dry wastes.

Tractors are equipped with hydraulic lifts so that they can quickly raise the parking wheels of a trailer off the pavement after they back under its nose.

Orders go from office to three points in the warehouse by fast, direct pneumatic tube system.

Wooden cheese crates fold flat to save space in return shipment and warehousing.

Structural Innovation

A unique bit of architectural design provides a huge area of unobstructed and well lighted floor space in the new printing plant. The roof consists of a series of flattened S-shapes standing at about a 60 deg. angle when viewed in cross-section. These are of concrete, and vertical skylights join the top of one S-shape and the bottom of the next. A design used in Holland for 12 or 15 yr., this structure will give roof support over a 140 ft. span without supporting columns.

Operates on Big Scale

De Gruyter operates three modern plants (1 million sq. ft. of factory space) that produce a wide variety of products—including bakery items, coffee, tea, confections, chocolate, cocoa, macaroni, dry soups, rice and canned foods. And it supplements these with products packed for it under its label to sell 500 items in its stores.

Its shops are modern, pleasant places, and 175 are self-service. The newest have 2,000 to 3,000 sq. ft. of floor space to handle dry groceries only—no meat, produce, or frozen foods.

Two thousand employees work in the factories, 3,000 in sales.

The firm even has a 120,000 sq. ft. printing plant for packaging materials, promotion pieces, and a weekly "newspaper". What's more, this plant makes its own printing plates.

De Gruyter owns a fleet of 50 tractor-trailers, plus delivery trucks. It brings employees to work in buses, using plant workers as drivers.—*End*

Promotion—Dutch Style

Highly promotion-minded, De Gruyter has a special technique for handling its lady visitors, who average 80 a day. It entertains them at lunch, photographs them, and sends the pictures to stores near the homes of each.

The firm also publishes an 8-page weekly "newspaper" and mails it to 1,800,000 housewives. While this publication presents information on De Gruyter products and prices, it also contains recipes and household hints.

How Sweetose Syrup ensures precise control of browning and sweetness—gives

That "Magic Touch" of Balanced Flavor...Appetizing Color and Sheen that builds repeat sales!

In catsup, Sweetose holds that "fresh-pack" rich red color. Enhances flavor. Improves gloss and sheen.

In sweet pickles, Sweetose assures balanced sweetness; a tangier flavor with faster finishing, less softening.

It takes a touch of magic if pork and beans are to have the kind of flavor and appearance that will win *complete* customer approval in today's highly competitive sales race. And there's no surer, more economical way to give your beans this delicate "just-right" touch than with Sweetose, Staley's enzyme-converted corn syrup.

Sweetose ensures precise control of browning without excessive cooking. Gives beans a deeper, richer, more appetizing color and sheen. Imparts a balanced sweetness that never varies. Delivers a zestier, tangier flavor that builds consumer loyalty for your brand.

For complete information on the quality improvement advantages Sweetose can give in a variety of applications, see your Staley Representative or write to:

A. E. Staley Mfg. Co., Decatur, Ill.

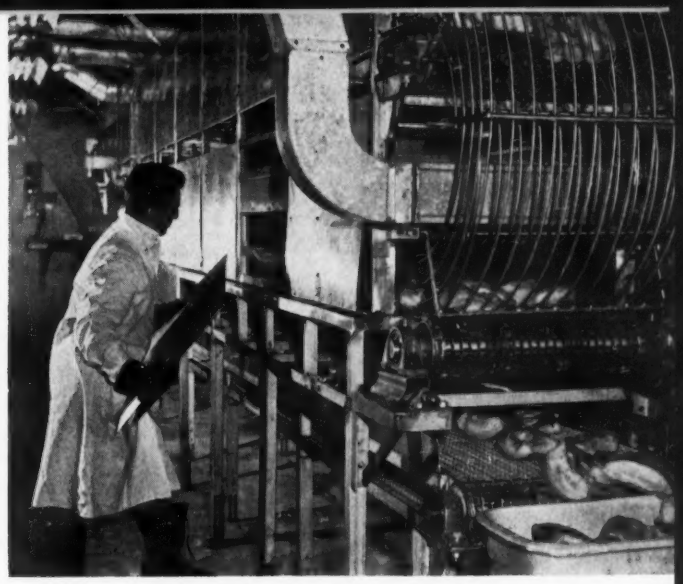
Sweetose®

THE ORIGINAL ENZYME-CONVERTED CORN SYRUP

BRANCH OFFICES: ATLANTA • BOSTON • CHICAGO • CLEVELAND • KANSAS CITY • NEW YORK • PHILADELPHIA • SAN FRANCISCO • ST. LOUIS

Faster Smoking With Electronics

It's done with special separate-chamber setup that puts meat through cure in 90% less time



MEAT is conveyed through smoking chambers and ovens on top tiers, then discharged from bottom belt (foreground).

NEW SPEED in smoking meats, plus improvement in quality, more uniform smoke penetration, and a saving in floor space are four of the benefits accruing to Fred W. Shattuck & Co., New York City, through use of a recently installed electronic unit.

The advanced equipment has cut smoking time of cured pastrami, for instance, from a minimum of 8 hr. (conventional smokehouse) to 30-35 min. Similar time savings have resulted with such products as slab bacon, barbecued spare ribs, butts, corned beef, chickens, and turkeys.

Company is also preparing smoked hamburger and corned beef patties with the unit. These will be packaged in institutional sizes—120 or 130 to a box—quick frozen and thus distributed.

ARTHUR V. GEMMILL
Senior Associate Editor, "Food Engineering"

How Process Is Stepped Up

In the conventional smokehouse, two operations—smoking and moisture removal—are carried out simultaneously. This necessitates raising inside temperature of the meat to 120-155 F. depending on type of product. To accomplish this with large pieces without overheating outside of meat requires long exposure to the warm smoke.

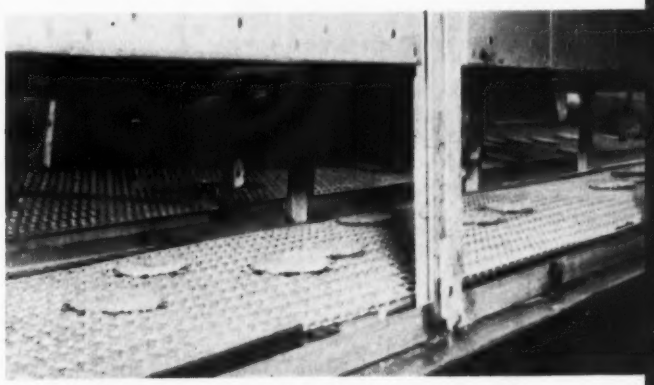
The Shattuck unit performs the two functions separately. In its two 10x3-ft. electrostatic smoking chambers the meat is literally bombarded with highly charged smoke particles. Then, in the two ovens, product is quickly heated throughout by infrared rays.

Machine is 30 ft. long, 3 ft. wide, 8½ ft. high. It incorporates three tiers, each with a motor-driven, endless stainless steel wire belt 2 ft. wide. Variable drives on each motor enable belt speeds to be adjusted over a wide range to suit requirements of the different products being smoked.

Top two tiers have smoking chambers and ovens, one above the other. Bottom tier is open. Here the meat completes its cook, then cools somewhat before it is removed.

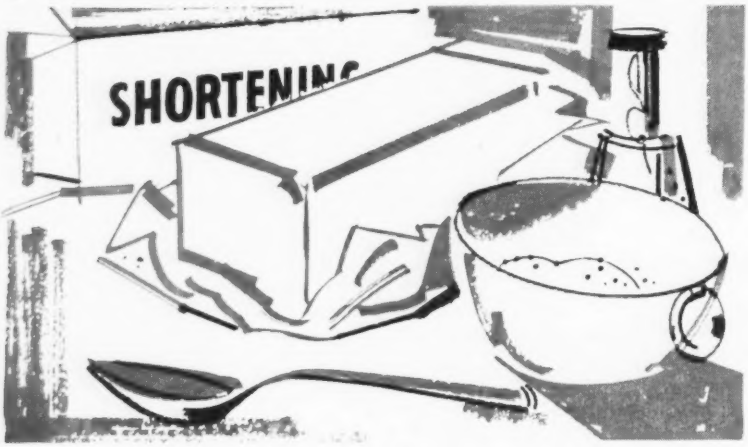
In operation, cured products, moved from the cold room on monorail-mounted tree racks, are manually placed on infeed end of top belt. They travel through first smoking chamber and first oven to end of unit, where they discharge from belt

EACH COMPARTMENT has 6 quartz lamps (24-in. long) in ceiling. They are mounted in pairs under the special reflectors.



MEAT PATTIES are conveyed on stainless wire belt through smoking and heating chambers. Side panels of latter are gold plated for maximum reflection.

West Carrollton
Shortening Carton Liners
STOP LEAKS



Put an end to those grease spotted cartons—a sure way to increase your lard and shortening sales. West Carrollton lard liner parchment gives that superior protection *plus* proven trouble-free operation on automatic packaging machines.

Vegetable parchment is *odorless*, *tasteless*, *non-toxic*, *grease-resistant* and *strong*—wet or dry.

Write for samples and complete details.

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GENUINE VEGETABLE
Parchment

serving
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since 1896

AUTOCLAVE PARCHMENT	CELERY WRAPPERS	LINERS FOR MEAT TINS	POULTRY WRAPPERS
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BAKERY PAN LINERS	FISH FILLET INSERTS & WRAPPERS	MASTER PARCHMENT	SAUSAGE WRAPPERS
BUTTER BOX LINERS	GIBLET WRAPPERS	MEAT WRAPPERS	TAMALE WRAPPERS
BUTTER TUB LINERS & CIRCLES	GREETING CARD PARCHMENT	MILK CAN GASKETS	TRI-WRAP & DUO-WRAP FOR SMOKED MEATS
BUTTER WRAPPERS	LARD CARTON LINERS	PARCHMENTIZED KRAFT	VEGETABLE SHORTENING CARTON LINERS
CAKE DECORATORS		POULTRY BOX LINERS	

SILICONE • MYCOBAN • QUILON & DRY WAXED PARCHMENT

CLEAN FOOD PAPER—For Delicatessen and Grocery Stores, also Fish and Meat Markets.

onto a stainless plate and slide down to second tier.

In this way the meat is turned so the previous bottom side is exposed to direct rays from lamps in second oven, and to the charged smoke particles in the second smoking chamber.

Leaving this smoking chamber, the meat moves onto another stainless plate that transfers it to the bottom belt. At end of this belt, products are removed, and (in case of larger pieces) hung on a previously emptied tree rack which moves them back to the cold room. In the case of patties, product is packaged and immediately frozen.

Fine Points of Machine

The two smoking chambers are equipped with wire grids to which are fed electricity at high voltage (12,000v. d.c.) from a power pack that transforms the normal line a.c. current. These grids positively charge the smoke particles so that they are drawn to the meat as it moves through the chamber on the grounded metal belt. This results in better coverage of the surface, and greater penetration than is possible in a conventional smokehouse.

The grids are suspended from top of chambers by cables that enable them to be raised or lowered depending on size of meat pieces being smoked.

Smoke is produced from hickory sawdust by a Mepaco generator and piped to the unit through a duct that branches to feed each chamber separately. In the chambers, it is directed downward on top of the charged grids. At other end, smoke is removed by an exhaust fan and discharged to the outside.

Electric eyes near entrance of each chamber continuously check density of the smoke inside, then indicate—by red and green lights on top of chambers—whether sufficient smoke is being fed into houses.

Ovens are comprised of 3-ft.-long sections (6 to an oven). In ceiling of each section are 6 GE 4,500v. infra-red quartz lamps, 2-ft. long. These are mounted in pairs with gold-plated reflectors above each pair. Side panels are also lined with gold-plated sheets to provide maximum reflection of heat rays onto the meat.

The lamps produce temperatures as high as 600F., but to raise center temperature of the meat to desired level without burning the outside, their operation is automatically cycled. On and off time is varied (by a manual setting) to suit size of cuts being processed. —*End*

FREE from your Local Jenkins Distributor...

"Most Valuable Guide to Valve Economy Ever Published"

TO OBTAIN IT

. . . write or phone your local Jenkins Distributor. If his supply should be exhausted, please request a copy direct from Jenkins Bros. (Dept. E), writing on your letterhead and giving the name of your Jenkins Distributor.

During the last war, when valves were in short supply, "Prevent Valve Failure Before It Starts" was prepared by Jenkins Bros. as a patriotic service. It has been called "the most valuable guide to valve economy ever published". Continuing requests for this out-of-print book led to a recent decision to reprint it.

This book is not advertising matter, and it contains no catalog data. It is costly to produce and the quantity is limited but plant and building operating and maintenance executives and others who install and maintain valves are more than welcome to a copy. Ask your local Jenkins distributor for it.

THE CONTENTS, and the purpose of this book, are given in the following Foreword; page 1 . . .

"Valve economy is an objective of good plant management at all times. It is more important than ever today because of the greatly increased costs of valve replacement and maintenance that have paralleled the rise in all expenses of plant operation.

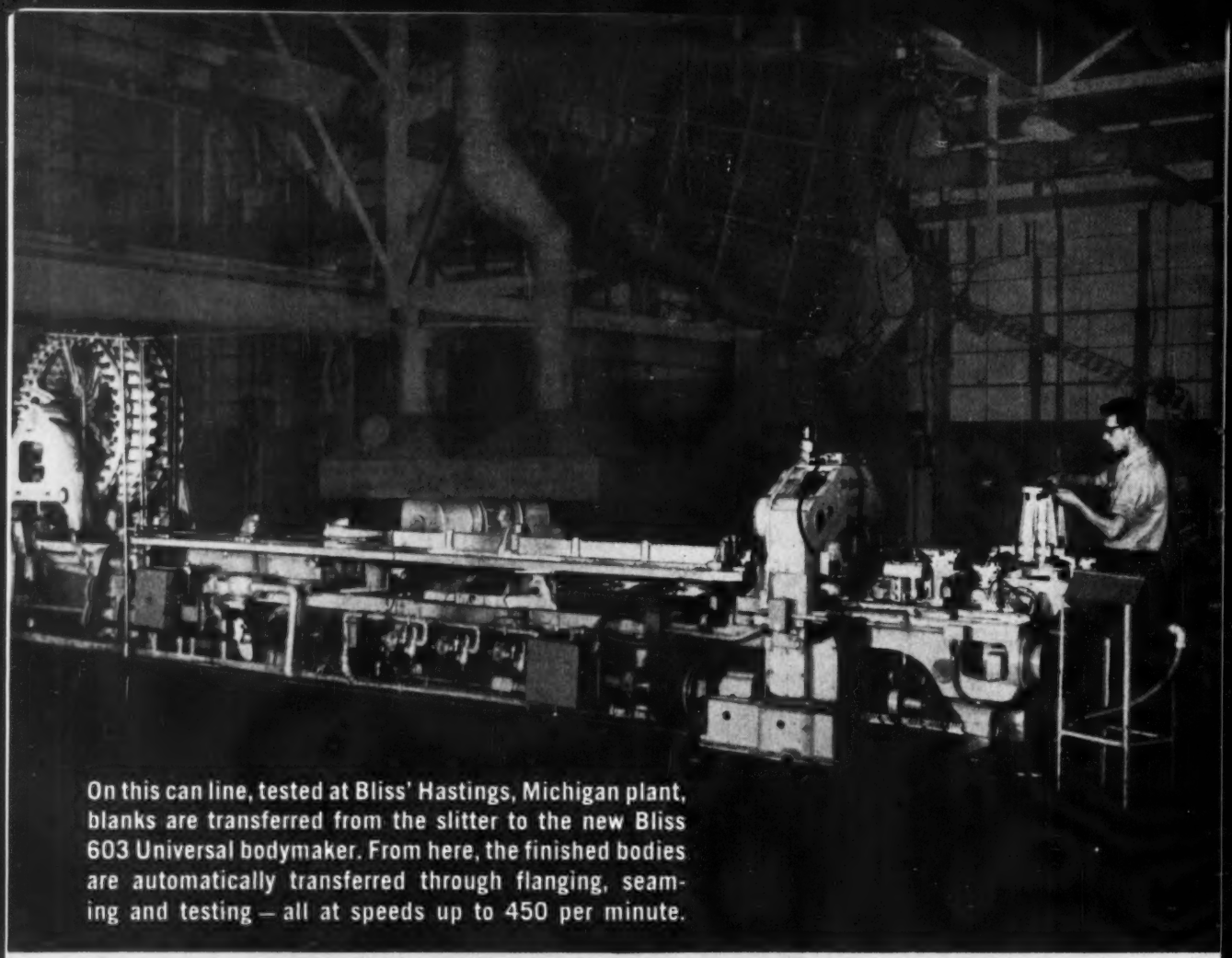
Most valve failure can be prevented before it starts. But to prevent failure, and insure the efficient operation of valves that contributes to plant productivity, four rules must be constantly followed: proper *selection*, correct *installation*, adequate *inspection*, and experienced *maintenance*.

This booklet has been prepared for plant management and supervisors, to explain and illustrate the principal causes of valve failure, how to prevent similar failures, and how to repair damaged valves. In addition to general instructions for installation and maintenance, it includes several examples of actual valve damage and destruction which have been brought to the attention of Jenkins Engineers. In each case the relatively simple precautions that would have prevented such needless waste are clearly explained, in non-technical language."

JENKINS VALVES

JENKINS SINCE 1864

Jenkins Bros., 100 Park Ave., New York 17.



On this can line, tested at Bliss' Hastings, Michigan plant, blanks are transferred from the slitter to the new Bliss 603 Universal bodymaker. From here, the finished bodies are automatically transferred through flanging, seaming and testing – all at speeds up to 450 per minute.

BLISS MAKES 2 MILLION CANS IN NOVEL TEST OF CAN LINE

For a few weeks last fall, E. W. Bliss Company was in the can-making business. When Bliss finished building the first of six complete can lines, they thoroughly tested the line by producing 2,000,000 cans in their own plant at Hastings, Mich.

Almost completely automatic in operation, the line produced the finished, tested cans at speeds up to 450 per minute.

Key unit is the new Bliss 603 Universal Bodymaker, shown above. The 603 makes a wider assortment of can sizes than any other bodymaker; can turn out bodies as large as 6-3/16" diameter and 5-9/16" high. The substitution of standard change parts enables it to make bodies 7-13/16" high! This remarkable versatility makes the 603 ideal for packers who use many different can sizes.

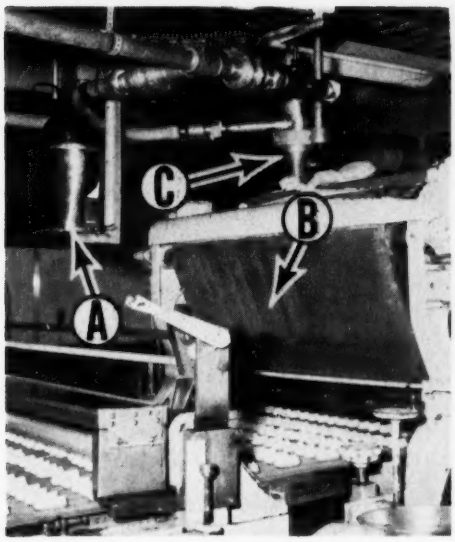
It will pay you to take a look at the new 603 and other equipment in the Bliss high-speed can line. To get complete information on these products, just drop us a letter —we'll send our latest bulletins.

BLISS
SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CONTAINER MACHINERY • CONTRACT MFG.



COLOR is suction-pumped from gallon jug (A) into marshmallow line going to cookie depositor (B). Color-'mallow blend gets further mixing by unit with built-in propeller-type agitator (C).

Gets Topping Flexibility With Pump-Meter Rig

Cookie runs streamlined by adjustable suction-feed that injects minute amounts of flavor-color blend into 'mallow moving from continuous mixer to depositor

ALL IT TOOK to accurately proportion a color-flavor blend into this continuous marshmallow line (photo) was a positive-displacement, ejector-type pump (¼-hp.) hooked to a varispeed drive (Reeves).

This setup has decidedly improved quality and production efficiency at Ripon Foods of Ripon, Wis., where the 'mallow feeds to a cookie depositor.

The method permits easy and rapid switching from one color topping to another by the operator of the cookie-depositing machine (Peters unit).

Moreover, need to clean continuous marshmallow mixer (Whizolater) and pipelines when changing to different colored marshmallow productions is abolished. And, since pump-metering installation is at continuous mixer's discharge line (near depositor), "streaking" of a white marshmallow run by residual color remaining in the system is avoided.

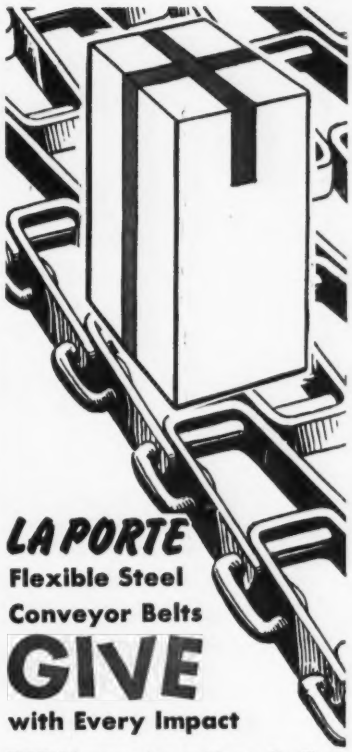
Here's the routine of the new system:

The color-flavor blend is carried in a 1-gal. glass jug that's placed in a stainless steel container suspended directly over the depositor. Plastic hose (2/16-in. dia.) is hooked to pump for adjustable suction feeding into 1¼-in. pipeline carrying marshmallow from continuous mixer. Feeding is adjustable in a ½ to 5-ml.-per-100-rpm. range of pump's motor.

Color-flavor blend is completely mixed in a 1-gal.-capacity stainless steel blender with a miniature, built-in propeller-type agitator. Colored marshmallow thus prepared is discharged into hopper feeding depositor that tops 'mallow onto belt-conveyed cookies. The topped cookies proceed through chocolate enrober and cooling tunnel and finally move to packaging line.

A second continuous marshmallow mixer is on stand-by duty so that it can be piped into the depositing setup to double output whenever production calls for topping a greater volume of 'mallow onto cookies.

—*End*



LA PORTE
Flexible Steel Conveyor Belts
GIVE
with Every Impact

WITH knee-action resiliency, La Porte Conveyor Belts flex under the shock and pressure of heavy loads on the receiving platform, at the loading hopper and the shipping dock. Yet they maintain a perfectly flat surface for products in process and containers empty or filled.

The open-mesh design keeps products from rolling off and permits the circulation of air and liquids around products in process. It also speeds up drainage and facilitates sterilizing with steam gun by one man while in motion. La Porte Belts are easily installed.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124
La Porte, Indiana

Please send free literature on your Conveyor Belt.

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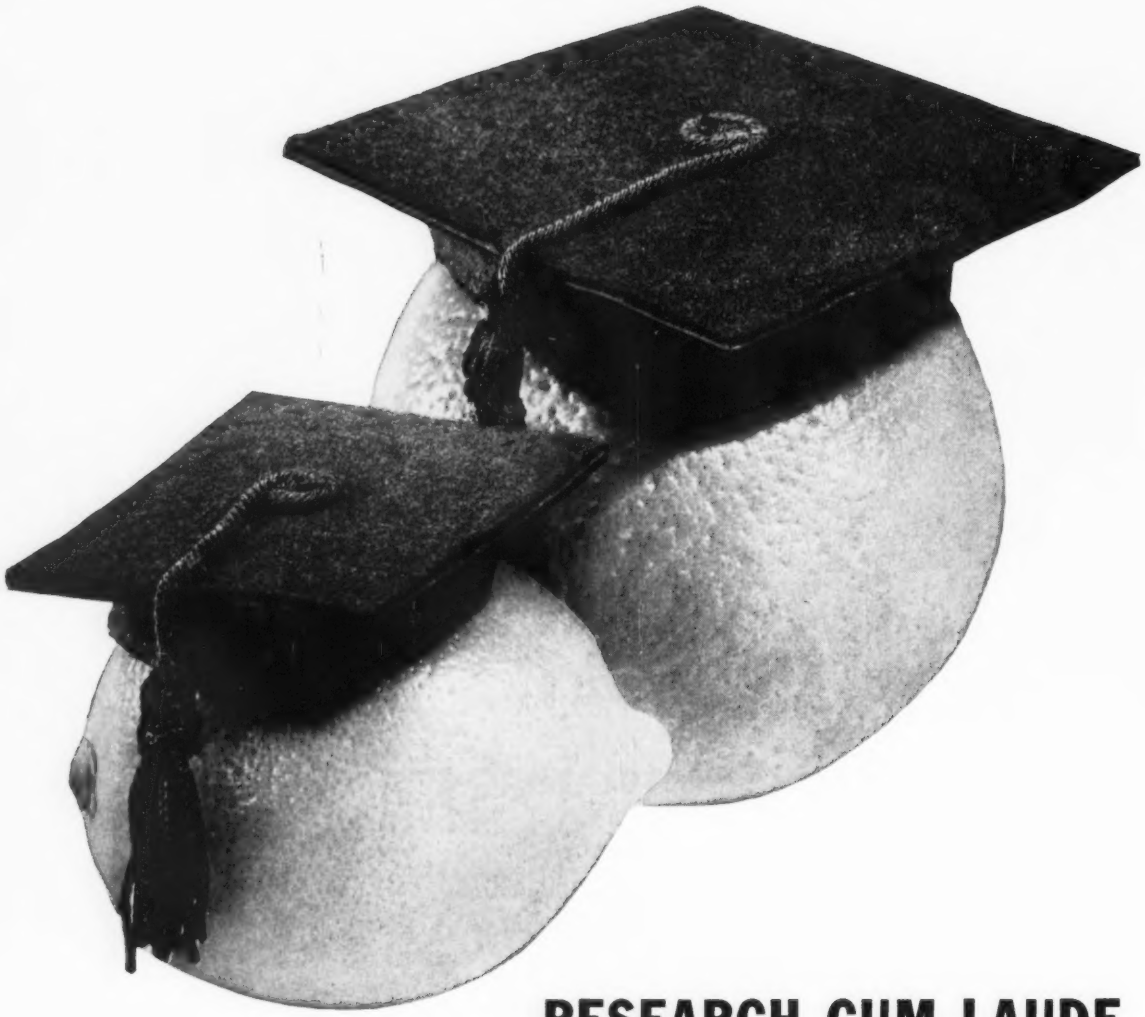


RESEARCH CUM LAUDE AT YOUR SERVICE!

You can profit from Sunkist's citrus research—pioneering work that has been awarded 118 individual U.S. food processing patents.

It's at your service to help you convert "good" products into *superior* ones...cure production headaches...develop new products.

Sunkist research has already created over 400 products for industry out of California lemons and oranges—and discovered new uses for citrus in everything from pharmaceuticals to shrimp freezing.

Exchange

Sunkist technical experts will be glad to work *with* you—in your own plant—or *for* you—in their own citrus research laboratory. Write, and a Sunkist man will call on you.

Sunkist Growers

PRODUCTS SALES DEPARTMENT

CAN LEMON JUICE DO A JOB FOR YOU?

If you're a food processor... fresh, frozen or canned... fruits and vegetables... fish or fowl... lemon juice can do *at least* one thing for you:

- It can prevent or retard off-flavor tendencies...
- Maintain and even enhance natural food flavor—keep food fresh-tasting longer...
- Prevent oxidation, preserve color, texture and flavor during and after processing...
- Adjust acidity in low-acid foods–retard enzyme action...
- Replace salt in low-sodium diet foods...

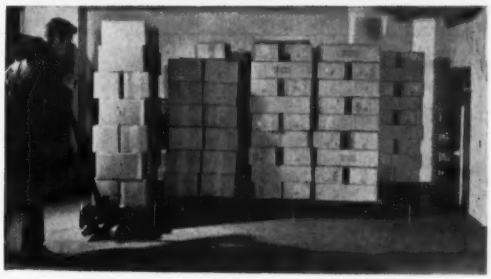
And that's only a beginning. The list of jobs lemon juice can do is an extensive one.

If you're not using it...you may be letting the competition get a lead on you. Don't market a product that's merely "as good as" the rest. Exchange Brand Concentrated Lemon Juice—made by Sunkist—can often make it superior for only a penny or two—and add a selling ingredient of distinction to your label.

Why not let your Sunkist man talk it over with you?

The address: Sunkist Growers, Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

IN PREPARATION for freezing, packaged candies are wrapped in polyethylene and cased . . .



. . . THEN THEY'RE MOVED to 0F. room to be stored until needed.

Freezes Goods for Plus-Profit

By storing candies at zero, Detroit confectioner levels the old costly production peaks and streamlines shelf-life factors . . . Flavor improved, too

"OUR LOW-TEMPERATURE boxes have paid for themselves in a mere 3 yr."

This comment by V.-P. Ken Phelps of Fred Sanders, large Detroit candy maker, indicates the company's satisfaction with its two 0F. freezers.

Used to store candies up to 3 months, they—

►1. Level peaks and valleys in production operations, thus eliminate previous high overtime expense at rush periods.

►2. Enable firm to keep shelf-life requirements on perishable candies down to a specified 2 weeks maximum in its own 43 stores and in the 52 supermarkets handling its products.

►3. Improve flavor of cream candies that initially are too harsh and solid.

The two freezers have 2,500 sq.ft. of floor space and will store up to 250,000 lb. of candy. They are cooled by blower-type units that require 8 tons of refrigeration.

Sanders' uses the freezers to store such perishable confections as its biggest seller, the "Family Box," which contains caramel and chocolate rolls and fudges. Before the boxes of goods are placed in the freezer they are packed in polyethylene-lined cartons. The film is then tightly closed around them (see top photo).

Object of the film is: (1) to protect product from condensation, and (2) prevent the sweating-drying cycle that turns chocolates gray.

Upon removal from the freezers, candies are stored 3-5 days in a 50F. room, then overnight at room temperature. They are then ready to be shipped.

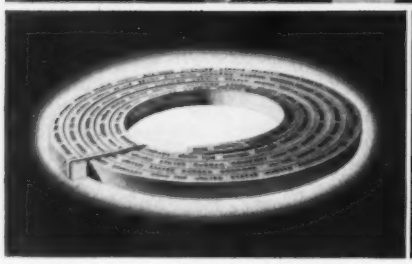
The freezing is beneficial to most candies. Sanders notes, however, that certain varieties, such as chocolate chips and nougats, will crack under the low temperature. —*End*

L. HOEY

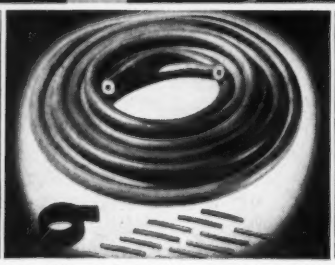
Special FE Correspondent, McGraw-Hill News Bureau, Detroit

US RUBBER Cooker Door Gaskets

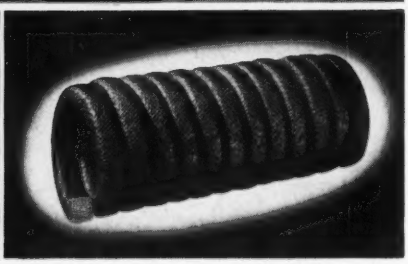
For Hot Cooking up to 350°



U. S. Peerless® Canvas Pump Packing (Style #463) is for use on inside packed pumps against hot or cold water, and for end rings in hydraulic sets. The method of manufacture reduces swelling to the minimum.



U. S. Eclipse® Red Tubular Gasketing (Style #803) is recommended especially for large exhaust heater doors and kettles where a large gasket is needed.



U.S. Rain-Besto® High-Pressure Rod and Plunger Packing (Style #101) handles high-pressure steam and air up to 500 degress F. It has a non-hardening cushion, treated with heat-resistant lubricants and preservatives.

U.S. Cooker Door Gaskets are especially designed for the food-processing industry . . . ideal to use on retort doors for pressure cooking, even up to 350°F. Being chemically inert, they also are fine gaskets for vats and kettles when cooking or processing soups, spaghetti, vegetables, pre-cooked meats, vegetable shortenings, and detergents. In all, U.S. Cooker Door Gaskets provide the food industry with a maximum of cooking cycles, lowering costs by eliminating the need for frequent replacements. Insist on U.S. Cooker Door Gaskets when replacing your present ones.

• • •

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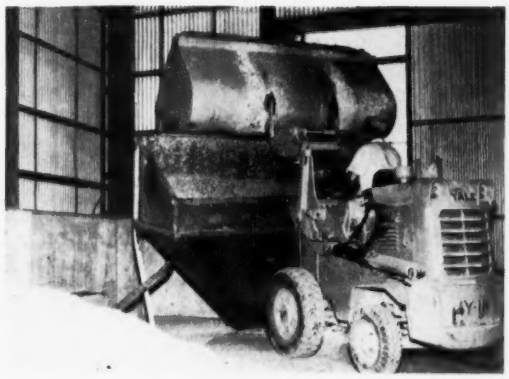


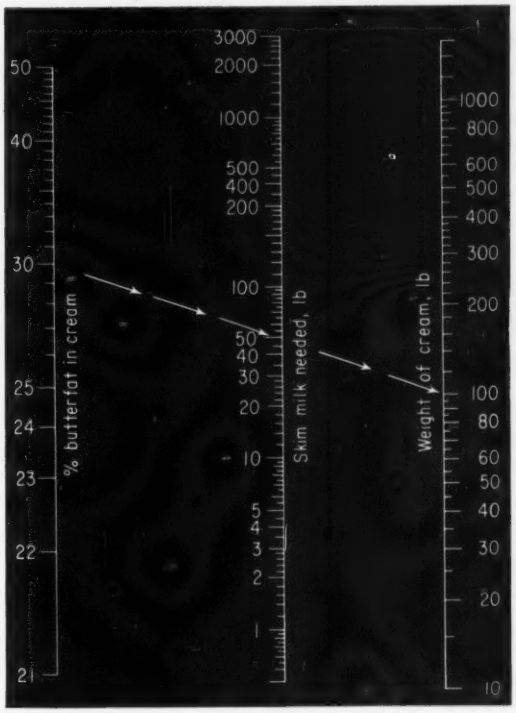
Wide-Bucket Tractor Shovel Speeds Peanut Handling

Savings approximating $2,000/yr. and a 25% speedup of its operations are benefits accruing to Gorman Peanut Co., Gorman, Tex., through use of a new tractor shovel with special 96-in. wide bucket (photo).

As clearing house for peanut production in 5-county area surrounding Gorman, our company handles up to 44,000,000 lb. gubers/yr. They arrive unshelled by trailer-truck or rail car and are conveyed to a 272-ft. long storage area.

Transportation from this area to hoppers that start processing cycle is by a new Yale Y-18 tractor with oversize bucket. Runs are from 8-272 ft. During harvest, unit is operated 8-10 hr./day, 6 days/week. It handles 100-105 tons daily. This is approximately 25% above capacity of previous method.

The large bucket can handle 1,800 lb./load. This represents about 1 man-hr. saving each day, or 300/yr. Although receiving hoppers are only 5 ft. high, the shovel's 6 ft. dumping clearance permits closer-in operation with less spillage. Tractor's maneuverability and automatic transmission are essential to our operation.—*Melvin E. Shell, President, Gorman Peanut Co.*



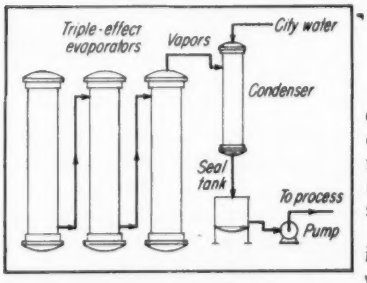
Makes Cream Standardization Simple

With this chart you may quickly and accurately compute amount of skim milk needed to standardize 21-50% cream to 20% butterfat.

Example: What quantity of skim is needed to standardize 100 lb. 30% butterfat cream to 20% fat?

Solution: Place one end of ruler on 30 (left scale), and other end on 100 (right scale), then connect points (arrows). At intersection of central scale read weight of skim milk (50 lb.).

This chart is based on $S = (0.05x - 1)W$: where S = weight of skim milk needed to standardize W lb. of cream, and x = percent butterfat in cream to be standardized.—*Tyler Hicks, Hicksville, N. Y.*



Previously Lost Vapors Now Heat Process Water

We used to discharge warm (90-100F.) condenser water into the Chicago River, but then we designed the simple system (drawing) for using it in our liquid sugar refining processes. System recovers 80,000 cu. ft. of water daily, and saves steam formerly required to elevate city water (from 35-40F. in winter, 65-70F. in summer) to 90F.

System heats city water by blending it in barometric condenser with vapor from triple-effect evaporator. Heated water is discharged through condenser leg into 400 gal. sealed tank at a 100-gpm. To prevent vacuum break in condenser, water level in tank is uniformly maintained by a float-control.—*John Van Schepen, Chief Engineer, Inland Sugar Co., Chicago.*

Accumulator-Bundler System Speeds Biscuit Packing

Preparing baked goods for shipping at Schulze & Burch Biscuit Co., Chicago has been expedited by a newly installed bundling system (Hayssen) that is fed from 3 high-speed cello-wrappers.

In operation packages are accumulated in groups of 6, with a divider and cover-board protector, and automatically wrapped in heavy 40 lb. kraft paper. Sides and seams are then sealed with adhesive. Package moves to automatic labeler where

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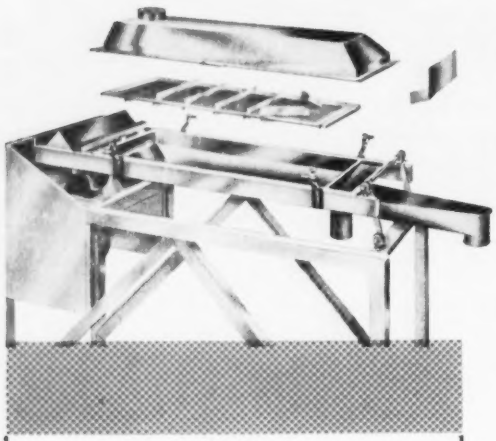
THE *Cirlyptic*® SIFTER

A new line of the highest efficiency sifters has just been added to the Entoleter line of processing equipment . . . The unique Cirlyptic Sifter action retains product in suspension thereby providing particles more angles of approach and maximum screen put-through. No surface friction greatly reduces screen blinding.



- Highest put-through capacity per screen area.
- No rubber balls to contaminate product.
- Flexibility of speed to achieve optimum screening action.
- All stainless steel construction.
- Meets rigid sanitary requirements.
- One minute disassembly for positive operator cleaning — Simple 3-part construction.

3 MODELS		
Capacity per Minute*	Power Requirement	Screen Area
250 lbs.	⅓ HP	5½ sq. ft.
500 lbs.	1 HP	11 sq. ft.
1000 lbs.	3 HP	22 sq. ft.

*(Rebolting flour on 30 mesh screen).

FOR MILK POWDER, PHARMACEUTICALS, PRE-MIX FOODS, CRYSTALS, FLOUR, CHEMICALS, ABRASIVES.

Also *Multiscreen Cirlyptic Classifier.* Up to 4 positive cuts without screen stacking.

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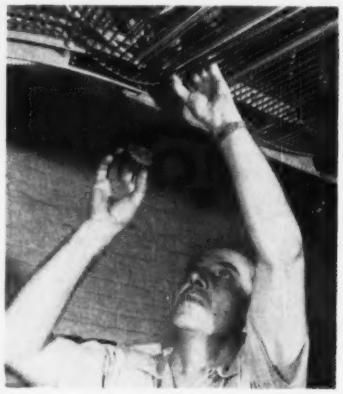
88 CIRCLE 88 ON READER SERVICE CARD

Practical Ideas

preprinted label is affixed with adhesive, and is delivered to shipping room seconds after entering accumulator.

According to W. Schneider, company's chief engineer, "Packages are neat and easily handled; system effected a substantial saving in labor, and labeler has improved product identification over previously used printed gummed tape."



Plastic Sprockets Stop Wear

Plant modernization at E. H. Koester Bakery, Baltimore, Md. included a mile-long, rod-type bread cooling conveyor. To obviate product contamination, no lubrication could be used.

But friction developing between contacting metal parts soon caused excessive wear. Sprockets and sections of conveyor chain frequently had to be replaced at considerable cost.

Solution of the problem was replacement of metal drive and idler sprockets with ones machined from Westinghouse Micarta. This heavy-duty, thermosetting, laminated plastic is resilient, gains impact strength from high temperatures, is best lubri-

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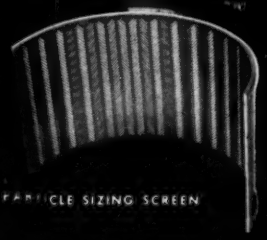
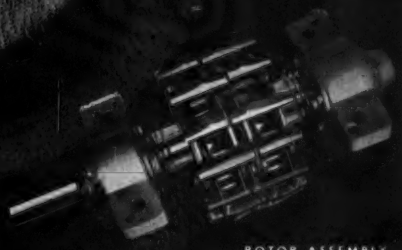
HOPPER

FEED SCREW ASSEMBLY



PARTICLE SIZING SCREEN



ROTOR ASSEMBLY

NO. 2DH MIKRO-PULVERIZER

APPLYING TECHNOLOGY TO REDUCTION PROCESSING . . .

Take a look at the "works" of a MIKRO-PULVERIZER, and you'll have a pretty good idea why these units have been receiving the nod of approval from the processing industries for so many years. It's not just a "grinder" . . . but a precision-engineered unit in which each component is carefuly machined and balanced, held to close, uniform tolerances. And this is true of the entire MIKRO-PULVERIZER line, from the smallest pilot plant mill to units producing upwards of ten tons per hour! You'll find the Mikro Laboratories at your disposal, ready to test grind your product and help you select the unit for your particular requirements. As an additional assurance, we're set up to ship genuine Mikro replacement parts to you within 48 hours of order. Bulletin 51A has the full story of models and capacities. It's yours for the asking, with no obligation.

MIKRO-Products

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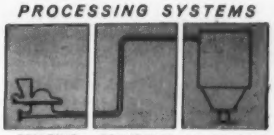

GRINDING CONVEYING COLLECTING

REPRESENTATIVES throughout the United States, Continental Europe, British Isles, Canada, Mexico, Central and South America, West Indies, South Africa, India, Japan, Philippines, Australia and New Zealand.
MANUFACTURING FACILITIES: United States, Canada, Continental Europe, British Isles.

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There are many ways to sell a product once . . . but repeat sales depend on the hidden magic of flavor, performance, texture, economy . . . customer satisfaction with your product.

Fast-growing way to achieve these sales assets is with the improvement added by enzymes. And today Miles Chemical is your best source for enzymes. Takamine products offer the widest variety of enzymes available . . . all highly specific in their actions . . . derived from fungal, bacterial, plant, or animal sources . . . and readily inactivated when their job is done.

Beverage or food product . . . Takamine enzymes can consistently help speed up processing, guard color and stability, enhance flavor, protect shelf life . . . endow your products with the hidden magic that captures repeat customers. Let us tell you more about these willing workers from Takamine. All inquiries are handled promptly.

TODAY'S WIDEST VARIETY OF ENZYMES

Amylases for any degree or kind of starch conversion in baked goods, beer, cereals, chocolate, confectionery, flavors, fruit juices, syrups, and vegetables.

Proteases for limited, selective or drastic proteolysis of most proteins in baked goods, beer, cereals, chocolate, meat and fish, and protein hydrolysates.

Glucose Oxidase for removing glucose or oxygen in beer, carbonated beverages, milk, eggs, flavors and juices.

Catalase to decompose hydrogen peroxide in cheese and egg processing.

Pectinase to increase yields, improve color, and speed processing in fruit juices and wine production.

Another Takamine food enhancer is sodium erythorbate (sodium isoascorbate) or erythorbic acid, economical antioxidants widely used to improve flavor, appearance and shelf life of many food products.

It will TASTE better, LOOK better, SELL better with Takamine products.

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Miles Chemical Company

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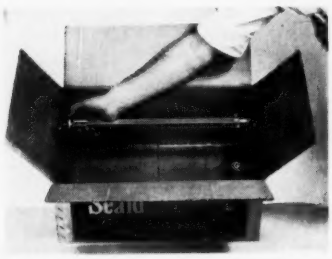
Ad No. 5-60

cated with water, and moisture doesn't harm it.

Steel sprockets had a 60-90 day life. Plastic ones installed several years ago, are still in service. Moreover, since their installation, no conveyor sections have required replacement.



Getting Box 'Specs' Is Easy Using Handy New Gage

A newly designed set of box gages now makes it possible to provide accurate specifications for box manufacture. One of these consists (photo) of a telescoping rod and tube fitted at both ends with flat plates.

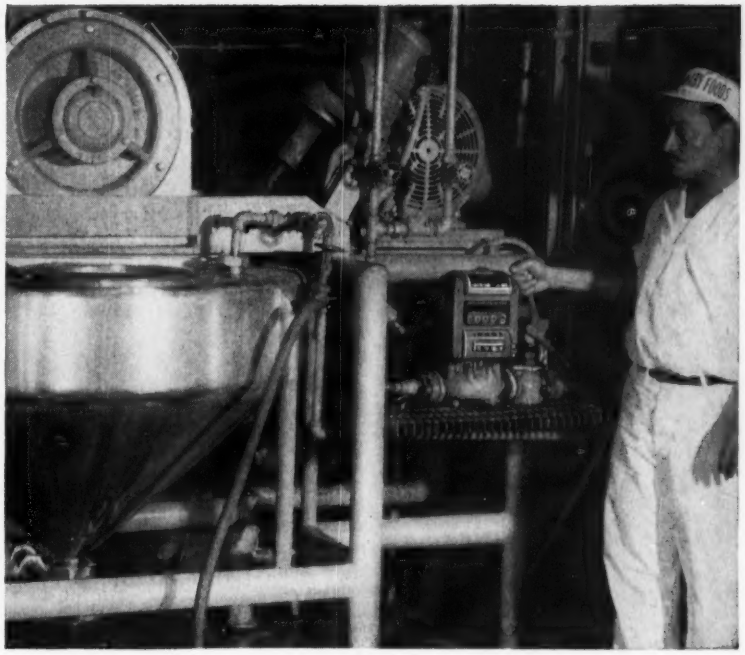
Rod is calibrated in inches, and tube is fitted with a pin-locking device that automatically locks rod at even increments of 1 in. as it is withdrawn from tube. A small window in tube shows inch setting of locked rod. There also is a manual lock for locking rod at any point on scale.

At opposite end of tube is a vernier adjustment operated by a knurled wheel. When rotated, it projects a shorter rod from the tube a distance of 1 in. This amount of movement may be read to $\frac{1}{16}$ in. from a scale section at that end of the tube. A set of three gages will accurately measure box dimensions from 6 in. to 34 in.—*Union Bag-Camp Paper Corp., Woolworth Bldg., New York City.*

Checks Uncrowned Bottles

A simple, inexpensive way to automatically spot bottles with missing crowns or empty feed chute is to mount a Micro-Switch in the chute that feeds caps to the crowner.

When there's a missing cap, switch rod drops in throat of chute, activating an alarm or shutting off filler. Known number of caps proceed to crowner (if only alarm system is used) before uncrowned bottles are discharged.



Accurate Neptune Meters add "FINISHING TOUCH" to Gerber Baby Foods

Precise volumetric control in finishing canned foods is a common problem. Gerber Products Company set about solving it with all the meticulousness they could muster for their sensitive baby market. Formerly they carefully weighed all ingredients of the batch, then introduced water manually up to a mark in the cone tank. Occasional human errors were costly.

Cure was to install two Neptune hot water meters with Auto-Stop quantity control. The operator simply pushes buttons to set the quantity required by the formula, and opens the valve. The meter shuts off automatically . . . delivers the exact quantity every time.

In another department Gerber uses Neptunes for accurate batching of liquid sugar and water. Improves quality control, reduces traffic on the mixing platform, saves time, and improves housekeeping.

You, too, can improve quality, and save time and materials with Neptune liquid meters.

GET THE FACTS
Ask for helpful Meter Data Bulletin 566 KFP See Neptune Data Pages in Chemical Engineering Catalog.

neptune

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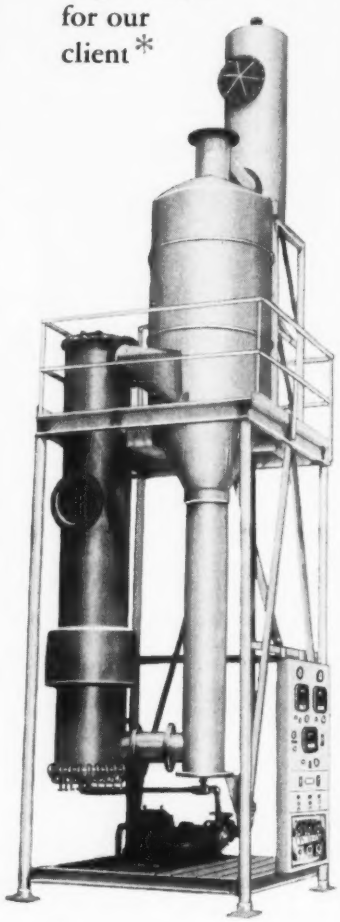

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THERMOVAC will custom-engineer and fabricate the processing equipment best for your job!

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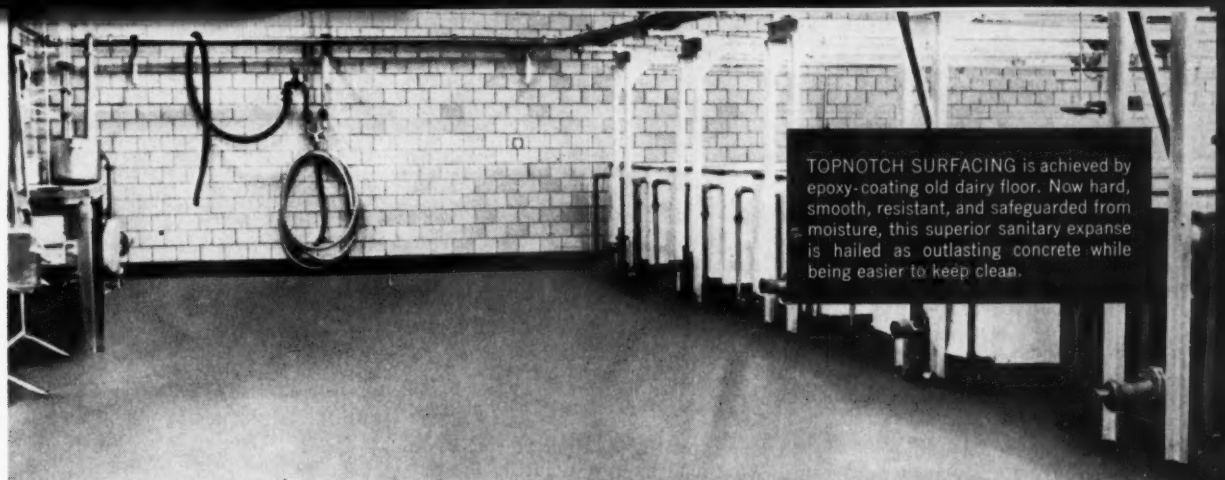

TOPNOTCH SURFACING is achieved by epoxy-coating old dairy floor. Now hard, smooth, resistant, and safeguarded from moisture, this superior sanitary expanse is hailed as outlasting concrete while being easier to keep clean.

Epoxy Floorings Really 'Take It'!

Fast winning favor are epoxy-mix surfaces combining special strength, chemical resistance, adhesive properties. Further, resins double as maintenance aids . . . Here's perspective of their striking uses in food plants, plus key "how-to" facts.

HOT TIP to maintenance men: A number of brand-new uses have now been developed for epoxy resins—inspired by their excellent physical and chemical properties.

Specifically, these plastic-making materials have an exceptionally high strength-to-weight ratio and outstanding resistance to corrosion. They're the closest thing yet to a "plastic steel." And they can now be used as maintenance aids in area projects once stymied by price.

Mainly employed for floor coatings, they offer chemical resistance and adhesive properties that outweigh their high material costs. In short, you can now coat and maintain corrosion- and erosion-resistant floors with top impact strength and long structural life. And applications also are in order on tanks, bins, walls, pipes, etc., that you seek to coat-protect against water, chemical, or abrasion attack.

Done with mix: The final product that you apply as a coating, adhesive, or filler is a plastic that's formed by blending carefully proportioned amounts of epoxy resin with a curing agent or hardener. Mixing results in a chemical reaction that releases heat — amount dependent upon types of resin and hardener and size of batch being prepared. If you mix too much at once, you will ruin a batch.

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

A Dozen Advantages

Benefits are numerous. These coatings are—

. . . **Reducing application costs.** On large jobs, labor costs have run less than 5¢ per sq. ft., compared with 50¢ to $1 for labor on conventional trowel-type coatings and $1.40 to $4.00 for laying quarry tile. Epoxies are a low-cost substitute for quarry tile.

. . . **Lowering installation costs.** Maintenance men quickly apply floor topping with roller or applicator. Downtime is greatly reduced—For a three-coat job, two applications can be made in one day and final one the following day.

. . . **Simplifying repairing or recoating.** One supplier offers a three-coat system with built-in color-warning primer that "tells" when touching up or recoating is needed.

. . . **Making floors safer.** Non-skid toppings consist of sand, aluminum oxide, carborundum, etc.

. . . **Withstanding heat.** Dry (400F.) and wet (220F.) heat don't affect the rugged new epoxy coats.

. . . **Providing excellent resistance** to elements and chemicals in both interior and exterior work. Alkalis and cleaning solutions won't adversely affect or discolor the topping. (However, spillage of acids and fruit syrups should be avoided to prevent straining during first week it sets).

. . . **Resisting high impact abrasion, oils, and greases.**

. . . **Preventing checking or 'alligatoring.'** Solids-type color coatings don't have much chalk.

. . . **Providing heavy mil thickness** (10 to 13 mils per coat).

. . . **Assuring maximum protection** with one to three coatings, depending upon requirements.

. . . **Facilitating maintenance.** Surfaces are easy to keep clean, don't harbor dirt or microorganisms. Since expansion joints are unnecessary, floor surface is monolithic, unseamed. Coved base, curbs, and wainscot can be turned up to any height at walls, columns, or partitions, as well as around pipes, tanks, machinery bases, etc., to form seamless union with floor. This way, installation is watertight and leakproof —positive protection against seepage

Working shots next page→

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to floors below during hosing-cleaning operations.

. . . **Protecting against fire hazards.** Floor is incombustible, therefore fireproof.

What's more, these epoxies are odorless and non-toxic when dry. Some can be applied on damp or new uncured concrete (but not in presence of hydrostatic pressure). They won't pull from walls or cracks—flexibly compensate for expansion and contraction.

Epoxy overlays are termed harder and stronger than concrete in thicknesses of $\frac{1}{8}$-in. (compared to $1\frac{1}{4}$ in. for concrete). They're hailed as more resistant to heavy traffic, as with steel-wheeled trucks. Being light (say about 1 lb. per sq. ft.), they don't require floor bracing.

In addition to resurfacing and patching floors, epoxies are also being employed as fillers and adhesives. Typical is pour-in repair of cracks and shallow holes. Where crack's deep and wide, patch technique is indicated. Fillings are used to seal windows and pipes.

As good organic adhesives, epoxies bond with metal, wood, concrete, glass, ceramics, certain rubbers, etc. For a "fast job" on a leaky pipe, for example, you can apply an epoxy-cloth "sandwich." First coat leaky area with epoxy mix, next lay patch of cloth over wet surface, then go over it with another epoxy coating.

One candy plant bonds epoxies with cement to repair concrete mountings for motors, compressors, and pumps. Here, epoxies serve to secure new concrete tops. Old bases are grouted out and cleaned before epoxy layers are painted on. Fresh concrete is poured over wet epoxy, then dried.

Meantime, a brewer has come up with the neat bonding trick of dipping screws into epoxy paint so that, once sunk into socket heads, they're truly secure, won't loosen out.

Available are the catalyzed resins to protect equipment from chemicals, abrasion, and impact. These thermosetting anti-corrosion finishes air-dry to high-gloss, glass-like, baked-enamel hardness. They're so flexible that a coated metal surface can be crimped or stamped without damaging the film. Steam won't destroy the film. And it's highly resistant to chipping, peeling, or cracking, even under long exposure. Because cleaning alkalis—even at boiling temperatures—don't destroy them, these tenacious films, find use in tanks, vats, kettles, retorts, pasteurizers, and bowls of filling machines. They also give a tile-like finish to walls.

Photo Brief Of a Job→

FLOOR cleaned, etched.

Check on Uses

Typical application of epoxies in the food industry point up the picture—

In dairies: Floors resurfaced with $\frac{1}{8}$-in.-thick coating without disturbing tank valves, pipes, footings.

In contrast, concrete resurfacing calls for thicker coats, often requiring costly changes in equipment connections, floor drains, and footings of equipment.

Trouble used to be that lactic acids, steam, and chemicals rapidly deteriorated surfaces in milk plants, entailing extra labor and costlier methods to make floors ship-shape.

In meat packing plants: Here, floors take a beating from brine, fat, blood, water. Before long, concrete cracks and corrodes, making cleaning difficult, maintenance costly.

Epoxies, on the other hand, resist these agents, protect old floors from moisture, also provide a lasting hard, smooth surface that's easier to keep clean. Packers report no signs of wear in over two years.

Some meat packers also have been using epoxy floorings (MID-approved), in coolers, smokehouses, sausage kitchens, killing areas, and bacon-slicing rooms to combat water erosion. Their concrete floors used to suffer when water dissolved cement filler, leaving behind the sand. Ruts that formed made it difficult to roll handling equipment without danger of tipping.

Packers have even epoxy-coated smokehouse trees.

In bottling plants: Epoxies resist syrups, fruit acids, and cleaning compounds.

In canneries: New-surfaced floors resist fruit acids, vinegar, syrups, and alkalis.

In breweries: Non-skid epoxies go on floors in bottling areas, keg rooms, sections near cleaning solution make-up tank, and concrete pads below pasteurizers.

In bakeries: Permanent-type clear coatings go on hardwood floors for protection, beautification, lower cost maintenance.

There are several methods of putting on epoxy mixes in coating form. Guides are the kind of protection desired and the type of surface taking the coating.

3 Ways to Apply

These coatings may be painted, troweled, or sprayed on. Painting is best for small areas requiring a light coat.

Abrasion-resistant coatings (heavier than corrosion-resistant ones) can be troweled on—thus applied faster than with brush.

Recently introduced, the special spray gun technique is employed for covering large areas needing only a light coat for water or chemical resistance. Here, main advantages of the gun are its speed in applying thin coats and elimination of pot life (time for epoxy blend to set up) Gun and accessories (pump, hoses, and containers) are portable (weight under 100 lb.). Spraying is also best where labor costs are too high. Even for small jobs (where labor isn't a factor), the gun will apply the blend at low cost.

In using the gun, resin and hardener (curing agent) are metered into different containers, then blended in a mixing head back of the nozzle. Blend is atomized as it's discharged from nozzle. Pot life is insignificant due to short interval between mixing and applying. Accordingly, you can use blends with short cure times without fear of them hardening in the pot.

Making the outlook for spray-gun application even rosier is development of new hardeners (Shell Chemical) providing controlled reactivity, requiring no heat for curing, and not adversely affected by high humidity. And when employed with a liquid epoxy resin base, these agents don't present a fire hazard.

Formerly, liquid epoxy base and

PRIMER, granules roled on.

MID-COATING, granules applied.

FINISH put on.

curing agent either had to be mixed in small batches having an application life of only about 20 min. or had to be sprayed on with mixing-head equipment (described above). Now, large batches can be blended for far longer working life. And ordinary spray guns will handle the mix without clogging.

When used with solvent-type coatings (based on resins of higher molecular weight), new hardeners provide a pot life of several weeks, as against only about a day using conventional curing agents.

Epoxies readily "take" to wood, tile, metal, or concrete floors. Just mixing the resin with right amount of ingredients (prepared by your supplier) produces your floor resurfacer, patcher, or complete topper. On the negative side are long cure times.

Focus On Application

Low cost was a prime reason when a large brewer epoxy-topped the concrete floors in the "had-to-take-it" areas of its new plant. Roughly, epoxies and labor cost this brewery about 40¢ per sq. ft. Tile would have been up in the $2 range.

This brewery first troweled on an epoxy, then followed with three painted coatings (formulations by Steelcote Mfg. Co.). There were 7 steps—

1. **Cleaning floor:** Scrubbing with phosphate-type detergent, then rinsing clean with water.

2. **Preparing surface:** Sweeping loose material from gouges and croded areas and racking it from cracks and fissures. Grease spots taken up with phosphoric acid degreaser. Finally washing surface with muriatic acid (1 part to 4 of water), water-rinsing, neutralizing (1 oz. 28% ammonia in 1 gal. water), squeegeeing, and drying by brushing and use of portable space heaters.

3. **Trowel-on floor leveling:** Surface troweled with heavy duty epoxy (mixed per Steelcote instructions) over gouges and spalled areas deeper than ¼-in. Finish to smooth surface. Area dried 4 hr. (temperature no lower than 70F.).

4. **Mixing resins for paint-ons:** Stirring and power mixing. One man using just enough epoxy and curing agent to produce a batch for a second man to spread in about 30 min. Mixing and spreading thus repeated during application of all three paint-on coats. Caution taken to power-mix a batch only long enough for uniform blending of color (too much mixing tends to overheat batch and cause it to set up too fast).

5. **First coat (gray):** Application held to uniform coverage of 150- sq. ft. per gal. (0.012-in. thick), employing 9-in. polyurethane-foam rollers. After a wait (at least 5 min. and not over 30) following coating, white sand (from supplier) uniformly sprinkled upon wet surface. Coating permitted to dry 12 hr., then swept free of loose sand with soft bristle broom, finally vacuum cleaned.

6. **Second coat (red):** Put on in same manner as first coat.

7. **Third coat (red):** Painted at rate of 225 sq. ft. per gal. Sand sprinkling omitted. Areas dried 12 hr. before allowing walking, 24 hr. before heavy traffic.

Safety Measures

There are the precautions that areas should be ventilated and smoking or flames avoided during mixing and application of epoxy coatings. Further, the epoxies and their hardening agents irritate the skin, cause rashes and burns.

Calling for greatest care are the hardeners—particularly the amines that are toxic not only upon contact with skin but when inhaled. But once the amine curing agent is mixed with the vehicle, it loses its toxicity.

Initial exposure to epoxies (and their curing agents) won't always irritate the skin. However, the skin tends to become sensitive weeks or months after exposure. Then rashes appear.

Your maintenance crew should become familiar with both epoxies and hardeners—know the safe way to handle them. Protective overalls, helmets, and gloves should be worn. In case these substances get on a man's skin, there should be initial washing with denatured alcohol, then with soap and water.

Ventilation of the working area is particularly in order when spraying epoxies. In fine-spray-droplets form these agents are more hazardous to eyes, lungs, and skin than when in

New Challengers on Horizon

Seen as coming lively competitors of epoxies for low-cost maintenance coat and patching honors are some brand new compounds—the isopolyesters (isophthalic acid-based polyesters).

Offering chemical resistance about the same as epoxies, these are put forward as lower in cost, less toxic, excellent in adhesion and flexibility, and easier to apply. Peroxides set them, whereas the epoxies require amine hardeners calling for cautious handling (see article).

Both types, however, share the same disadvantage: The need to work with a "two pot" system—resin and catalyst.

Clear polyester can be brushed on. But when a resin mixture is catalyzed (peroxide catalysts, benzyl and methyl ethyl ketone) and promoted (with cobalt naphthenate or dimethyl aniline agents for speeding reaction at room temperature), then working life is too short for big jobs.

It's to be noted that without the promoter, setting times are too long. This is where the newly developed dual spray guns (one feeding catalyzed resin, the other promoted resin) have now made a breakthrough.

mixes handled with trowel or paint brush. When doing small jobs, use of epoxies should be limited to one small area at a time to reduce exposure hazard.

Further Working Factors

As in cement jobs, there's a time limit that influences initial setup (or gelling) of an epoxy blend. Also, mix doesn't attain maximum strength until the end of a certain curing period. Most epoxies set between ½ and 2 hr., while curing (when epoxy mix is applied at room temperature) takes 2 to 7 days.

Suppliers have been able to shorten gelling and curing times by the simple expedient of raising cure temperature above 200F. Time required at these elevated temperatures depends, however, upon blend.

Also to be noted is the epoxy softening (heat distortion) point, which is in the 180- and 200F. range when room-temperature cured. This point can go to 220F. and higher if you give the resin a 2-hr. post-cure bake somewhere between 200 and 300F. with a suitable heat source (like heat lamps).

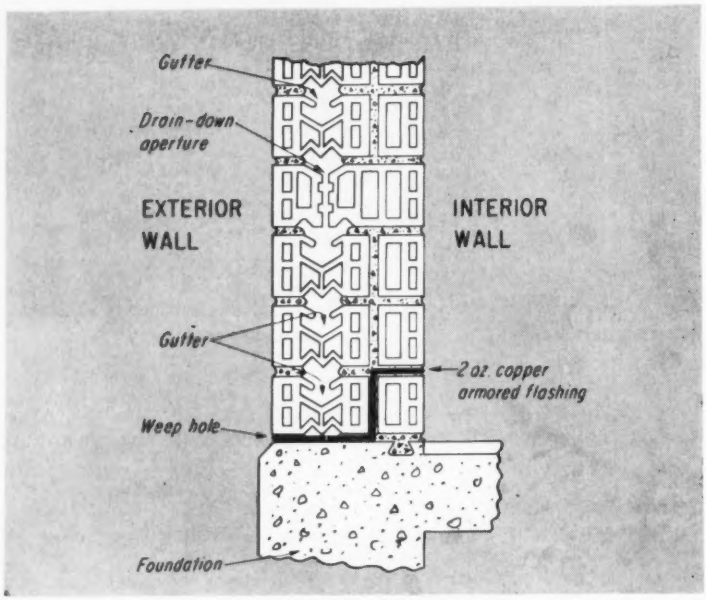
Some epoxies have softening points up to 500F. However, these are special blends calling for high curing temperatures and certain other application requirements.

Biggest problem users have encountered is gel time (pot life). Once prepared, the mix must be applied before it hardens. So it's best on big applications to run a sequence of several batches, each of an amount that's just large enough to handle within hardening time.

Gel and cure times, as well as cure and softening temperatures, depend upon the combination of selected epoxy, hardener, and filler for controlling heat of chemical reaction. It's evident, therefore, that results will vary. Accordingly, it's wise to consult your supplier on proper blends for specific applications.

Epoxy distributors can help you in several ways. Some furnish individually packaged ready-mixes along with detailed instructions. These are most economical for relatively small jobs. Also, some companies will either do the complete coating job for you, or will assign one of their men to guide your own crew in the task.

The author makes particular acknowledgment to the following for their assistance in the preparation of this article: W. F. Macklin Co., Inc., Minneapolis; E. H. O'Neill, E. H. O'Neill Floors Co., Cicero, Ill.; and Greg. S. Niedt, Steelcote Mfg. Co., St. Louis.



BLOCKED by gutter gaps incorporated in special tiles, rain water is effectively barred from interior wall. It drains to weep holes that discharge it to exterior.

Keeps Out Rain Seepage

Improved wall construction wins notable maintenance and sanitation savings for NBC. What's more, erection and labor material costs are reduced

EFFECTIVE and economical sanitation and maintenance programs for any new food plant must begin with the structure of the proposed building. And relative to its wall construction, it's very important to take steps against water seepage.

Yearly interior repairs, repainting, and overall cleaning costs caused by seepage are decidedly minimized at the new Fair Lawn, N. J., plant of National Biscuit Co.–for in structuring this facility, "gutter" tiling was employed rather than conventional mortar joints.

The usual joints can form continuous passages for rain water to enter, creating dust-catching areas and unsightly appearance. However, the special exterior masonry walls specified by NBC construction engineers –the Modular Dri-Speedwall (Natco Corp., Pittsburgh)–traps any water that gets through. And it's drained to weep holes that discharge it to the exterior–never reaches interior surfaces.

This type tile forms a gutter (see drawing) between exterior and interior wall sections. The water cannot bridge this gap, instead drops from one tile row to the next until it is diverted out at window cappings and foundation through the weep holes. At these areas, copper armored flashing seals the window lintels, sills, and foundation. General contractor was The Walter Kidde Constructors, Inc., New York.

A 30% saving in wall-erection labor and materials is also claimed for these tiles, with each slated to be the equivalent of six conventional bricks. The tile's gutter offers a natural grip for masons, thus easing the handling and speeding the laying.

Use of improved sanitary structural materials, such as the new tile, is part of an intensive NBC program begun in 1945. Company officials report that program action has solved a number of troublesome construction problems that otherwise predicted higher costs and difficulties in overall plant sanitation and maintenance. —*End*

IN BG&C PILOT PLANT, raw materials are broken by impulse renderer (arrow), drop onto vibrating screen that separates protein-containing liquor from fiber. Liquor is pumped to centrifuge (top left) that removes oil. Fiber is washed (foreground) then dried.

Protein From Grasses —by Sonics

New British process uses HF to break down vegetable matter and alkaline solution to dissolve released protein

CHEAPER RECOVERY of protein from vegetable matter—by using hydraulic shock waves—is claimed for a process recently developed by British Glues & Chemicals, Ltd. London.

Technique makes use of the fact that protein dissolves in alkaline water, thus may be easily separated from other valuable products of the raw material. Grass, leaves, cottonseeds, and peanuts have all been successfully processed in a pilot plant.

Resulting protein is nearly colorless and almost tasteless. It could be employed as an additive to cereals or cooking fat without any noticeable alteration in flavor or performance.

Crux of process is the impulse renderer, first developed to degrease bones (FE. Feb. '53, p. 195). It consists of a chamber containing a motor-driven, paddle-blade impellor that imparts shock waves to the water in which the material is suspended. Cutting action is minimized by rounding edges of the blades and allowing large clearance between blade and container.

Shock wave frequency is critical for each variety of raw material, since otherwise the protein cells are either not released or are pulverized into an inseparable emulsion. Employed are frequencies in the 30,000-40,000/min. range.

Water-to-material ratio is also critical—concentration must be at a maximum. However, there must be sufficient water to transmit the shock waves, otherwise the rotor would act as a grinder and require five times as much power. Water used is slightly alkaline (0.1% soda solution) in which state it dissolves the protein and some of the oils.

NICK LANDON

Special FE Correspondent
McGraw-Hill World News, London

Operating Specifics

When processing oilseed, slurry from impulse unit flows to a vibrating screen that separates fiber from the protein solution. Latter is fed to a 3-way centrifuge that separates it into: (1) Insoluble oils, (2) cellulose slury, and (3) protein together with any oil remaining in solution. Protein solution is then adjusted to pH 4.5-4.8 and fed to a precipitation tank.

Further centrifuging results in a mixture of 70% water, 20% protein, and 10% oil. Toluene is added as the oil solvent, and remaining water is removed, leaving a light-colored, low density, 90% pure protein.

This final step incurs at least 75% of the total operating costs, but it is claimed that any simplification attempted has adversely affected protein quality.

The separated cellulose is washed and dried, to be used for animal feeding. The insoluble oil is washed, refined, and clarified.

When processing leaf material, vibrating screen separates fiber (which may be used for paper manufacture or fuel) from protein solution, which goes to the precipitation tank.

Centrifuging separates protein from a high-viscosity syrup containing many useful byproducts. These include chlorophyll, carotene, xanthophyll, various hormones, sterols, steroids, and vitamins. Syrup from grass contains enough carotene for it to be profitably employed as an animal diet supplement.

Company's pilot plant is at present handling one long ton of raw material per hour, but the minimum economic size of commercial unit will process four tons hourly. Power requirements is about 100 kw. per ton of raw material.

As a method of oil extraction from groundnuts (peanuts), the process is claimed to be cheaper than conventional methods. Added advantage is that the local inhabitants could have the benefit of the protein.

Present plans are to license the process and collect royalties. Due to the unusual interest being shown, however, the company is considering a partnership arrangement in order to provide sufficient trained engineers for installation, supervision, and instruction to plant management. This latter is seen of major importance since many of the solvents used for oil and other byproduct extraction are highly volatile and flammable. In backward countries, a responsible staff to handle such solvents may prove difficult to obtain.

Future plans include a survey of (1) grasses to isolate high-protein strains, (2) methods of fertilizing crops to increase the protein yield, (3) possibilities of using the waste process water as fertilizer, and (4) experiments on recovery of the water-soluble vitamins and sugars.

—*End*

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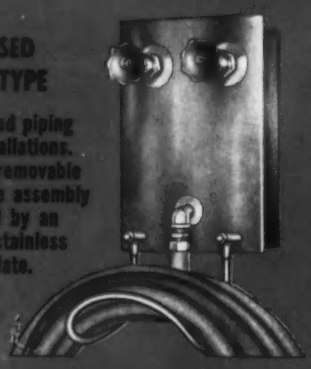

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Latest Additive-List Developments

Time Extensions Predominate . . . Green Light to Many Paper Agents

A RUSH of new additive listings marked FDA's recent traffic-jammed Mar. 6 deadline. Encompassed in these fresh tabulations were time extensions on direct agents, paper packaging-material substances, and pesticides.

In addition, nearly a hundred substances related to manufacture of paper food-packaging materials were favored with "safe" listing in prior-sanction and GRAS categories. (For earlier listings, readers are referred to FE Jan., p. 81-82; Feb., p. 19-21; and Mar., p. 89-91.)

28 Paper-Making Agents On Prior-Sanction List

The following 28 substances utilized in making food-packaging paper and paper products are now classed by FDA as having prior sanctions—

(b) Substances Used in Manufacture of Paper and Paperboard Products Used in Food Packaging:

Aliphatic polyoxyethylene ethers*; 1-Alkyl (C_8-C_{18})-amino-3-aminopropane monoacetate*; Borax or boric acid for use in adhesives, sizes, and coatings; Butadiene-styrene copolymer; Chromium complex of perfluoro-octane sulfonyl glycine for use on paper and paperboard which is waxed*; Disodium cyanodithioimidocarbamate with ethylene diamine and potassium *N*-methyl dithiocarbamate and/or sodium 2-mercaptobenzothiazole (slimicides)*;

Ethyl acrylate and methyl methacrylate copolymers of itaconic acid or methacrylic acid for use only on paper and paperboard which is waxed*; Hexamethylene tetramine as a setting agent for protein, including casein*; 1-(2-Hydroxyethyl)-1-(4-chlorobutyl)-2-alkyl (C_8-C_{17}) imidazolinium chloride*; Itaconic acid (polymerized);

Melamine formaldehyde polymer; Methyl acrylate (polymerized); Methyl ethers of mono-, di-, and tripropylene glycol*; Myristo chromic chloride complex; Nitrocellulose; Polyethylene glycol 400; Polyvinyl acetate; Potassium pentachlorophenate used as a slime-control agent*; Potassium trichlorophenate as a slime-control agent*;

Pyrethrins in combination with piperonyl butoxide in outside plies of multiwall bags*; Resins from high and low viscosity polyvinyl alcohol for fatty foods only; Rubber hydrochloride; Sodium pentachlorophenate as a slime-control agent*; Sodium trichlorophenate as a slime-control agent*;

Stearato-chromic chloride complex; Titanium dioxide*; Urea formaldehyde polymer; Vinyl chlorides (polymerized).

** Under conditions of normal use, these substances would not reasonably be expected to migrate to food, based on available scientific information and data.*

Grace Periods Granted 14 'Directs', 19 'Indirects'

Time extensions (1 yr. from Mar. 6, or until earlier decision on final tolerances or denials) have been granted by FDA in new listings of 33 food additives.

Of these, 14 are classed as direct additives—

Direct Additives	Limits	Specified uses or restrictions
Annatto colorants	35 ppm. (based on annatto solids).	As coloring in foods.
Butylated hydroxyanisole and/or butylated hydroxytoluene.	0.001% (combined total)	As an antioxidant in dry mixes for making prepared foods.
Butylated hydroxyanisole and/or butylated hydroxytoluene, and/or propyl gallate.	0.005% (combined total)	As antioxidants in breakfast cereals.
Copper pyrophosphate	0.005% of copper in total daily ration.	In mineral mixtures used in concentrated animal feeds.
Cottonseed flour (cooked and partially defatted).	5%	In bakery products.
3,5-Diiodosalicylic acid	300 ppm.	In salt blocks for animal use.
Ethyl cellulose	35% by weight	In dry vitamin preparations for animal feed and human food use.
Fumaric acid	0.3%	In foods as an acidulent, flavoring, and leavening agent
Polyoxyethylene (20) sorbitan monooleate	0.1%	In frozen desserts (other than water ices), as an emulsifier.
Do	do	In imitation ice cream, as an emulsifier.
Do	0.05%	In pickles, as an emulsifier.
Do		As an emulsifier in flavored foods when used at rate not to exceed 9 parts by weight per 1 part of flavor.
Polyoxyethylene (20) sorbitan monostearate.	0.475%	In cakes as an emusifier.
Do	0.45%	In cake icing, as an emulsifier
Do	0.5%	In confectionery coating, as an emulsifier.
Do	0.2%	In sugar confectionery pan coatings, as an emulsifier.
Do	0.4%	In whipped topping, as an emulsifier.
Do		As an emulsifier in flavored foods when used at rate not to exceed 9 parts by weight per 1 part of flavor.
Polyoxyethylene (20) sorbitan tristearate.	0.1%	In frozen desserts (other than water ices), as an emulsifier
Do	do	In imitation ice cream, as an emusifier.
Quinine sulfate	0.01%	As flavoring agent in carbonated beverages.
Sorbitan monostearate		As an emulsifier in flavored foods when used at rate not to exceed 9 parts by weight per 1 part of flavor.
Sorbitan monostearate in combination with polyoxyethylene (20) sorbitan monostearate.	0.475%	In cakes, as an emulsifier.
Do	1.0%	In confectionery coating, as an emulsifier.
Do	0.4%	In whipped topping, as an emulsifier.

The other 19 agents form a new section of indirect additives used in connection with production, packaging, and storing of food products—

Indirect Additives (a) General list	Limits	Specified uses or restrictions
Bromides, inorganic*	50 ppm	In processed foods from methyl bromide fumigation.
Carbon tetrachloride		As a fumigant, in food plant use.
Coumarone-indene resin*	200 ppm.	In coating on citrus fruits.
Chloropicrin		As a fumigant, in food plant use.
Dibutyl phthalate*		Not to exceed 2.17% in nitrocellulose-coated, heat-sealing cellophane for packaging foods.
Dicyclohexyl phthalate*		Do.
Ethylene dibromide		As a fumigant in food plant use.
Ethylene dichloride		Do.
Maleic acid*		Not to exceed 0.09% in nitrocellulose-coated, heat-sealing, cellophane for packaging foods.
Mineral oil		Not to exceed 2% in fiber bags to contain dry foods.
Mono fatty acid ester of polyethylene glycol.		Not to exceed 0.8% in film wrappings for food.
Pentacrythritol tetrastearate*		Not to exceed 0.09% in nitrocellulose-coated, heat-sealing, cellophane for packaging foods.

(Continued on next page)

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Piperonyl butoxide	As a fumigant in food plant use.
Polymers of pimaric and abietic acids and/or rosin constituents.*	Not to exceed 0.64% in nitrocellulose-coated, heat-sealing cellophane for packaging foods.
Polyoxyethylene (20) sorbitan monooleate.	Not to exceed 1.48% in film wraps for meat, as an emulsifier.
Propylene oxide	As a fumigant in food plant use.
Pyrethrins	Do.
Tetraethylene pentamine	Not to exceed 1.77% in coatings for food-storage containers.
Titanium dioxide N. F.*	Not to exceed 20% in adhesives for food packages.

*Additives from an earlier list (FE Mar., p. 89) now reclassified as "indirects."

67 Paper Substances Put in GRAS Class

Newly tabulated by FDA in the category of substances "generally recognized as safe" (GRAS) are 67 "migrating" agents involved in the manufacturing of food-packaging papers and paper products—

(f) Substances Migrating to Food From Paper and Paperboard Products Used in Food Packaging—Generally Recognized as Safe:

Acetic acid; Alum (double sulfate of aluminum and ammonium potassium, or sodium); Aluminum hydroxide; Aluminum oleate; Aluminum palmitate; Ammonium chloride; Ammonium hydroxide; Calcium chloride; Calcium hydroxide (lime); Calcium sulfate; Casein; Cellulose acetate; Clay (kaolin); Copper sulfate; cornstarch; Corn sugar (syrup); Dextrin; Diatomaceous earth filler; Ethyl cellulose; Ethyl vanillin; Ferric sulfate; Ferrous sulfate; Formic acid or sodium salt; Glycerin; Guar gum; Invert sugar; Iron, reduced; Locust bean gum (carob bean gum); Magnesium carbonate; Magnesium chloride; Magnesium hydroxide; Magnesium sulfate; Methyl and ethyl acrylate;

Mono and diglycerides from glycerolysis of edible fats or oils; Oleic acid; Oxides of iron; Potassium sorbate; Propionic acid; Propylene glycol; α-Protein; Silicon dioxides; Pulps from wood, straw, bagasse, or other natural sources; Soap (sodium oleate, sodium palmitate); Sodium aluminate; Sodium carbonate; Sodium chloride;

Sodium hexametaphosphate; Sodium hydrosulfite; Sodium hydroxide; Sodium phosphoaluminate; Sodium silicate; Sodium sorbate; Sodium sulfate; Sodium thiosulfate (0.1% in salt); Sodium tripolyphosphate; Sorbitol; Sulfamic acid; Sulfuric acid; Starch, acid modified; Starch, pregelatinized; Starch, unmodified; Sucrose; Talc; Urea; Vanillin; Zinc hydrosulfite; Zinc sulfate.

More Time for 100-Plus 'Indirect' Paper Agents

Extra time (1 yr. from Mar. 6, or until earlier decision on final tolerances or denials) has been accorded more than a hundred indirect additives falling in category of substances migrating to foods from paper packaging materials.

Included here are 92 defoamers, an indeterminate number of rosin substances, and 30 miscellaneous agents—

(b) Substances Migrating From Paper and Paperboard Products Used in Food Packaging.

(1) Defoaming Agents:

Aliphatic hydrocarbon fractions of petroleum; Castor oil; Cetyl alcohol; Coconut alkylolamide; Coconut oil, sulfonated; Cottonseed fatty acid; Cyclohexanol; Diethamolamine stearate Ethylenediamine tetraacetic acid tetrasodium salt; Formaldehyde; Glycerol monohydroxystearate; Hexadecanol; Hexylene glycol; Hydrogenated fish oil; Isobutanol; Isopropanol;

Kerosene, completely aliphatic; Kerosene oil; Kerosene oil, deodorized; Lauryl alcohol; Lignin sulfonate sodium salt; Marine oil fatty acid soaps (hydrogenated); Methyl oleate; Methyl oleate-palmitate mixture; Methyl tallowate; Mineral oil; Mustardseed oil, sulfated; Myristyl alcohol; Naphtha; Oleic acid, animal source; Oleic acid, sulfated;

Oleic acid, vegetable source; Oil paraffin; Oil paraffin, pale paraffin oil; Parachlorometacresol; Paraffin wax; Peanut oil, sulfated; Pentaerythritol monostearate; Polyalkylene glycol ether; Polyethylene (slightly oxidized); Polyethylene glycol, ester of rosin (15M); Polyethylene glycol, ester of rosin octylphenol; Polyethylene glycol 200, monotallate;

Polyethylene glycol 200, monooleate; Polyethylene glycol, monostearate; Polyethylene glycol 400, ditallate; Polyethy-

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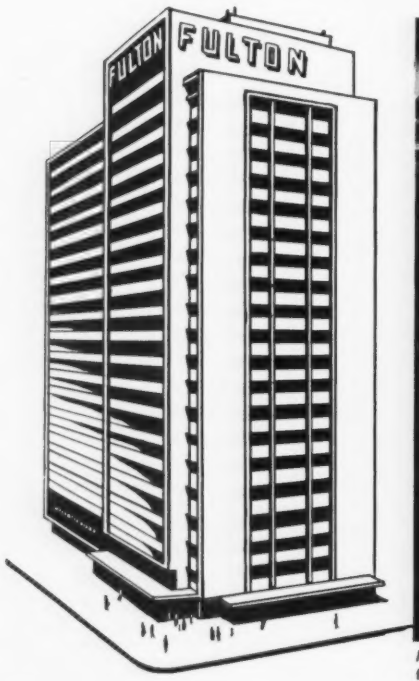
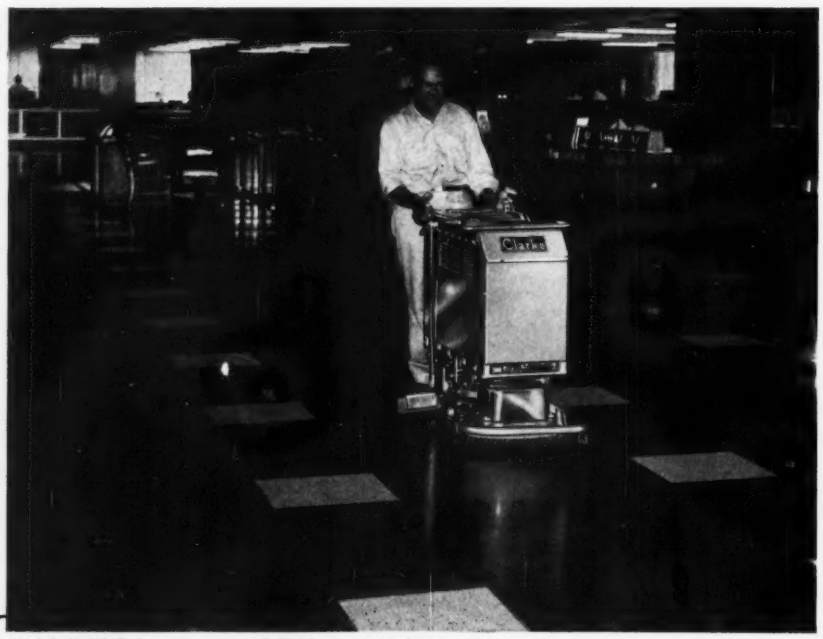




Model PS-20BP battery powered Clarke-A-matic cleaning floor in main lobby of Fulton National Bank, Atlanta, Ga.

lene glycol 400, dioleate; Polyethylene glycol 400, distearate; Polyethylene glycol monococoate; polyethylene glycol 400, monolaurate; Polyethylene glycol 400, monooleate; Polyethylene glycol 400, monostearate;

Polyethylene glycol 400, monotallate; Polyethylene glycol 400, tallow diester and glycerides; Polyethylene glycol 450, monostearate; Polyethylene glycol 600; Polyethylene glycol 600, monooleate; Polyethylene glycol 600, monoricinoleate; Polyglycol ether of tridecyl alcohol; Polyoxyethylene sorbitan monostearate;

Rice bran oil; Rice bran oil, sulfated; Ricinoleate (butyl); Ricinoleate (methyl); Sodium stearate, technical grade; Sorbitan monostearate; Sorbitan tristearate; Sperm oil, sulfated (75%); Stearic acid; Stearic acid, single pressed; Stearic acid, double pressed; Stearic acid, rubber grade; Stearic palmitic acids, 63:29;

Stearyl alcohol, technical grade, approximately 65-80% stearyl and 20-35% cetyl; Tall oil fatty acid, methyl ester; Tall oil, refined; Tallow, alcohol, hydrogenated; Tallow, blown (oxidized); Tallow fatty acids; Tallow fatty acids, hydrogenated; Tallow, hydrogenated; Tallow, monoglyceride; Tallow, propylene glycol ester;

Tallow, sodium soap; Tallow sulfated (75%); Tallow, sulfated (80%); Tallow, sulfonated (50%); Tallow, unbleached; Triethanolamine (98%); Triisopropanolamine; Zinc stearate.

(2) Rosin and Rosin Derivatives. As incidental additives to food from the use as components of adhesives, wax and other coatings, plasticizers, inks, lacquers, sizings, paper finishers, defoaming and dispersing agents, intended for use in the manufacture of paper and paperboard for the packaging of food.

Wood rosin, gum rosin, and tall oil rosin and the dimers thereof, and these substances as modified by following reactants:

Bisphenol-formaldehyde, Ethylene glycol, Formaldehyde, Fumaric acid, Glycerin, Hydrogen, Maleic anhydride, Methanol, Pentaerythritol (double-crystallized), Phthalic anhydride, Sulfuric acid, Triethylene glycol.

(3) Miscellaneous Chemicals and Substances Used in Manufacture of Paper and Paperboard for Food Packaging. As incidental additives to food from the use as components of adhesives, wax and other coatings, plasticizers, inks, lacquers, sizings, paper finishes, slime-control agents, dispersing agents, and/or other uses:

Acrylic and methacrylic esters (acqueous emulsions of polymers), Animal glue, Anionic polyacrylamide, bis(1.4-Bromoacetoxy)-2-butene, Carbon black prepared by "impingement" or "channel" process, Dibutyl phthalate, Dicyclohexylphthalate, Dicyandiamide, Dimethyl polysiloxane polymer, Dioctyl sodium sulfosuccinate,

Hydroxyethylcellulose, β-Hydroxyethyl pyridinium salt of 2-mercaptobenzothiazole, Hydroxyethyl starch, Mixture of ketene dimers of palmitic and stearic acids, Monosulfonated napthalene, Oxidized starch, Pentaerythritol ester of maleic anhydride, Polyamide-epichlorohydrin resin, Polyoxyethylated castor oil, polyoxyethylated oleyl alcohol,

Polyvinyl alcohol, Sodium dodecylbenzene sulfonate, sodium lauryl sulfate, Sodium ligninsulfonate (sodium lignosulfonate), Sodium nitrate, Sodium salt of naphthalene sulfonic acid condensed with formaldehyde, Sodium salts of dimethyl dithiocarbamic acid and 2-mercaptobenzothiazole, Triethylene glycol polyester of phthalic anhydride (modified),

Vinyl acetate dibutyl maleate copolymer, Zinc dimethyldithiocarbamate in combination with zinc salt of 2-mercaptobenzothiazole.

Give 13 Pesticides Additional Time

A new FDA order permits use for another year (from Mar. 6) of 13 pesticidal chemicals in or on raw agricultural commodities.

Employment of these agents (which include nematocides, plant regulators, defoliants, and dessicants) must conform to uses and amounts as specified. The list follows:—

Calcium carbide to produce acetylene: On pineapples to induce flowering.

2,4-Dichlorophenoxy acetic acid: On potatoes to intensify color.

Ethylene: On pineapples to induce flowering and on citrus fruit to bring out color.

Isopropyl (N-3-chlorophenyl) carbamate: On potatoes to inhibit sprouting.

Maleic hydrazide: On potatoes (residue limits 50 ppm.) and onions (residue limits 15 ppm.) to inhibit sprouting.

Methyl ester naphthalene acetic acid: On potatoes to inhibit sprouting.

Napthalene acetamide: On apples to thin fruit and control fruit crop.

Naphthalene acetic acid: Blossom spray for thinning fruit. (A tolerance of 1 ppm. is already established for residues from stop-drop use on apples, pears, and quinces.)

Sodium salt of α-naphthalene acetic acid: On pineapples to induce flowering.

Sodium salt of β-naphthoxy acetic acid: On pineapples to delay maturation.

2,3,5,6-Tetrachloronitrobenzene: On potatoes to inhibit sprouting.

2,4,-5-Trichlorophenoxy acetic acid: On apples to thin fruit and control fruit drop.

2,4,5-Trichlorophenoxy propionic acid: On apples to thin fruit, control drop.

ClarkeAmatic DOES A 16 HOUR JOB IN 45 MINUTES

Before placing the Clarke-A-matic self-propelled floor maintainer on the job, four men worked four hours to clean the 7214 sq. ft. of terrazzo floors in Fulton National Bank's main lobby. The floor was cleaned only once a week—a total of 16 hours labor time.

Today, the floor is cleaned in 45 minutes by *one* man with a Clarke-A-matic, reducing labor time 15 hours and 15 minutes each time the floor is cleaned, which, according to Fulton Bank's calculations, is a labor saving of 95 percent.

In addition, a better housekeeping job is accomplished and customers are provided with a safer, more sanitary floor. The floor is now cleaned *three times a week*. These three cleanings, requiring 45 minutes each, total only 2¼ hours—saving 13¾ hours each week.

Put briefly, Fulton Bank's Clarke-A-matic does three times the cleaning for less than one-seventh the former cost.

And one more thing: Clarke-A-matic gets floors clean. Instead of just moving dirt around with a mop, it scrubs, picks up and dries—all in one pass—and leaves floors sparkling. And, the Clarke-A-matic is self-propelled—ideal for cleaning large floor areas in any institutional, commercial or industrial building.

All these Clarke-A-matic advantages and savings can be yours!

Ask to have your Clarke distributor tell you how many hours and dollars you can save with the right size and type of Clarke maintenance machine. He'll gladly prove it by putting the machine through its paces on your floors.

THE BEST KNOWN NAME IN FLOOR MACHINES

Clarke
FLOOR MACHINE COMPANY

814 E. Clay Avenue, Muskegon, Mich.

Authorized Sales Representatives and Service Branches in Principal Cities
Distributed in Canada: G. H. Wood & Co. Limited, Box 34, Toronto 18, Ont.

SYSTEM STARTS HERE at packing department, where varieties of candy are cartoned. Roller conveyors then takes cases through sealer, and to storage rack.

PALLET LOADS are built right on storage lines at back of rack, permitting first-in-first-out use of stock. Only one man is needed to load rack.

FILLED RACK presents orderly array of the many candy varieties. Frontage measures only 70 ft., allowing speedy order selection and assembly.

ORDER PICKERS select cases from pallets and assemble goods on platform trucks. These are then rolled to dock for commercial-carrier pickup.

'Live' Rack Cuts Order Time 80%

Using less building space, "Controlled Flow" palleted-goods storage greatly accelerates case handling at St. Paul candy plant

ANSWER to your goods-handling problems may be live storage.

It's proving so for many firms. Example: The Pearson Candy Co. of St. Paul. Minn., which adopted this system for its new warehouse and reaped these four benefits–

- **Order-picking time down 80%.**
- **First-in-first-out use of stock assured.**
- **Building-size requirement reduced 45%.**
- **Aisle-space needs minimized and storage space maximized.**

Firm had initially planned to construct a warehouse 144x80 ft. with a 22-ft. ceiling. But use of the compact Controlled Flow Pallet Rack (The Rapids-Standard Co., Grand Rapids, Mich.) enabled reduction of the dimensions to 80x80x12 ft. And the smaller building actually holds more cases than would have been accommodated by the originally planned facility.

Only one man is needed to receive cartons from packing department and place them on Flow Track wheel conveyors of 70x60 ft. rack. Wheels are pitched to allow pallets to roll forward at a safe speed controlled by an electrical braking mechanism.

At selection end of loaded rack, order pickers walk only 70 ft. to pass in front of all items stored–whereas original plan would have required walking up to 330 ft. to select an order.

Cartons arrive from packing area on roll conveyor and leave on platform trucks, minimizing manual handling. *—End*

CIRCLE 103 ON READER SERVICE CARD→

"15% sales increase due largely to Knox-designed jar," says president of leading gourmet foods firm

The handsome fluted glass packages shown above were designed by Knox Glass, Inc. in 1957 for a leading Eastern manufacturer of gourmet foods.*

According to the firm's president:

"Sales increased nearly 15% after changing to the fluted jar which Knox Glass designed exclusively for us.

"The eye-catching salesmanship of the jar, which has no label other than the closure, permits the purchaser a clear, clean view of our appetizing products, such as Potato Salad, Cole Slaw, Macaroni Salad and Vegetable Chow Chow. Knox's strong design and the excellent quality of the glass we buy from Knox, combine to make this a wonderful package.

"We've been a Knox customer for nearly seven years and buy almost exclusively from them. Special quality products such as ours demand high quality glass and exceptional service. This we get from Knox."

Find out more about how Knox can meet your glass container needs — contact Knox Glass, Inc., Knox, Pennsylvania.

*Name available on request.

the new/**KNOX GLASS**

With a Fuller Airveyor Conveying System . . .

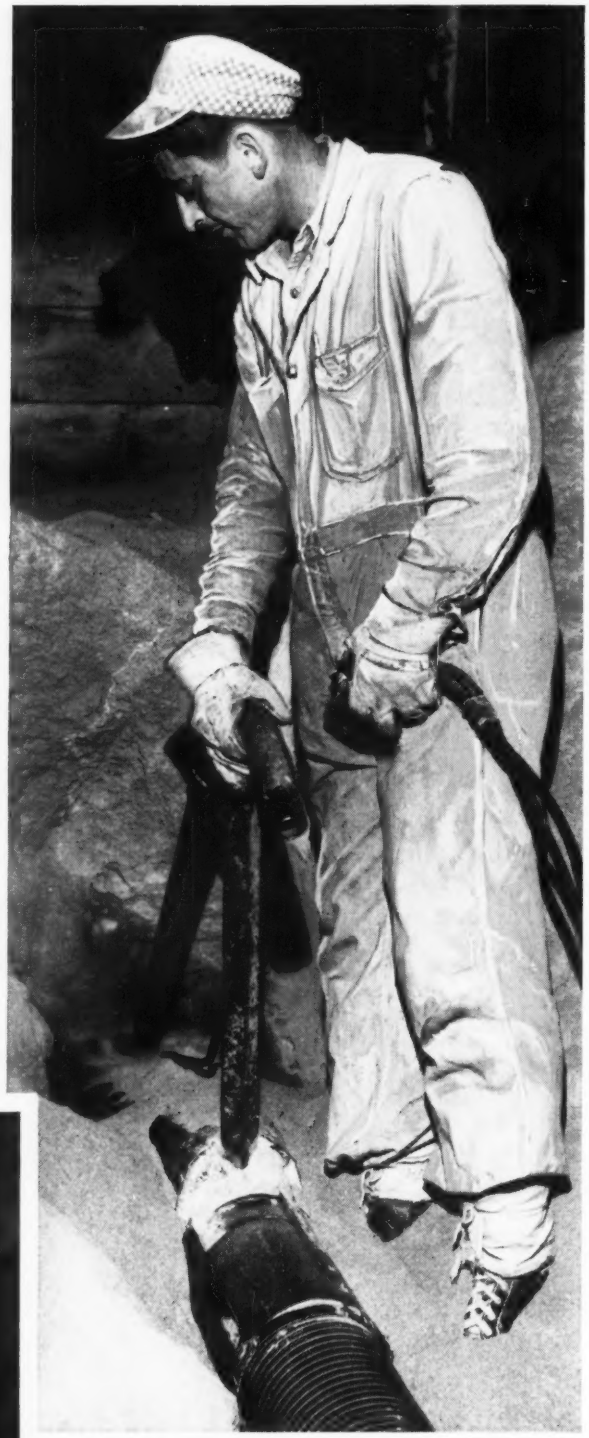
Unloading 30 Tons of Feed Ingredients In Less Than One Hour Is a One Man Job at Ralston Purina

A Fuller Telescopic Airveyor® pneumatic conveying system moves bulk animal and poultry feed ingredients from siding to storage at Ralston Purina's Harrisburg, Pa., mill. The operator keeps the Airveyor nozzle buried in the material by regulating the length of the hose—the telescopic Airveyor conveying system does the rest.

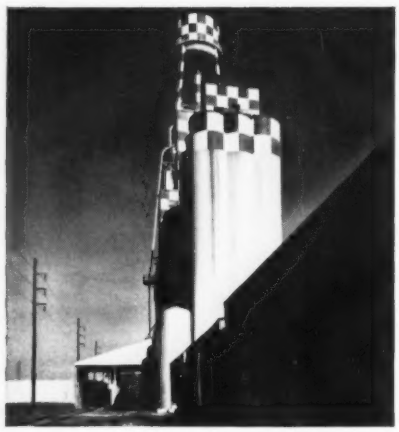
Soybean meal, midds, bran, and other ingredients are sucked vertically 165 feet up 12 stories to any one of 30 storage bins. As the operator works deeper into the car, he simply pushes a button to raise or lower the hose one foot or twenty to reach *any* point within the car. Work never stops to add or take off sections of hose.

Obtaining the savings inherent in bulk purchasing, eliminating the dust hazard, and greatly reducing handling costs are some of the ways Fuller Airveyor conveying systems cut operating expenses in the moving of dry, bulk materials.

Consider the low initial cost and many operating economies of Fuller pneumatic conveying systems when you plan to increase plant capacity. Write or phone today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendation. 1323C A282



Operator controls unloading of feed ingredients at rate of 30 tons an hour — up 12 stories to storage, just by pushing a button.



FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY
114 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

Fuller
....pioneers in harnessing AIR

Sr^{90} Removed From Milk By Ion Exchange Resins

When milk containing radioactive strontium was passed through ion exchange resins similar to those used in home water softeners, some of the Sr replaced Ca on the resin and some of the Ca took the place of the Sr in milk. Percent Sr removed depended on: (1) Source of the milk; (2) kind of resin; (3) nature of resin-conditioning material, and (4) amount of milk exposed to a given quantity of resin.

Treated milk showed higher acidity lower pH, harder curd, and shorter rennet coagulation time than milk not treated. First milk coming through the column tasted slightly bitter, but that passing through later was nearly normal in taste.

Data indicate that contact for longer than 10 min. removes but little additional strontium. Amount removed depends upon the milk-resin ratio, ranging from a high of 94% at a ratio of 2 parts milk to 1 part resin, to a low of 21% at a milk-resin ratio of 200-1.—*J. Dairy Sc.*, 137-45, Feb. 1960.

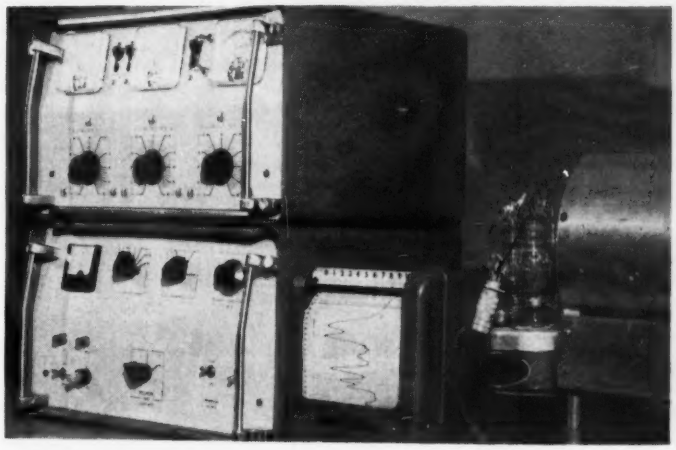
Antibiotics Plus Radiation Inhibit Bacteria in Bacon

Holding temperatures, methods of packaging, irradiation, and antibiotics each have an effect on quality of stored sliced cured bacon.

Untreated slices and others dipped in 100 ppm. OTC were: Vacuum packed (27-29 in.) in pouches of Saran-coated Mylar laminated to polyethylene, and air packaged. These were stored at 32-38F. during transportation to and from reactor where half of the packages were irradiated at 200,000 rads.

Then packages were stored at 3 temperatures — 40-50F., 36-38F., and 28-32F. Samples were removed at predetermined intervals over a 9 week period and evaluated bacteriologically and organoleptically.

Combination of antibiotic and irradiation was superior for controlling bacterial growth at all temperatures. However, treatments with either or both produced off flavors. Vacuum packaging was superior to air on all counts. Best results were obtained by vacuum packaging and storing at 28-32F.—*Food Tech.*, 92-93, Feb. 1960.



New Instruments, Advanced Procedures Facilitate Accurate Pesticide Tests

Pesticide residues on leafy vegetables and other food products can be accurately determined with an analyzer recently developed by Stanford Research Institute.

System comprises three major modules and a titration cell. Former are: (1) A gas chromatograph and micro-combustion furnace; (2) power supply for chromatograph, and (3) a Coulometer (photo).

For rapid screening, a ¼-in. O.D. x 6-ft. long aluminum column, packed with 30/60 mesh Chromosorb (Johns-Manville) coated with 15-30% high-vacuum silicone grease (Dow-Corning) is satisfactory. To avoid chemical effects Chromosorb is washed with hot 6N HCl, followed by distilled water.

A Coulometric detection system (Dohrmann) is used to follow elusion of pesticides from separation column. Unit is based on continuous titration of chloride and sulfite with silver ions that are electrically generated in titration cell. Its success was dependent on design of titration cell. A four electrode system is used, including two sensor electrodes and two generator electrodes.

Gases eluded from separation column are mixed with oxygen in furnace and burned to form CO_2, H_2O, HCl, etc. Mixture is bubbled through titration cell. Under these conditions, coulometric detector is specific for chloride.

If combustion is followed by catalytic hydrogenation, in high-temperature furnace, sulfur is converted to H_2S and both chloride and sulfide are detected by Coulometer. Sulfur-containing constituents may be determined by difference between results of the two tests.

Electrical current used to maintain constant silver ion concentration in titration cell is recorded on strip chart, as function of time. Type of pesticide is determined by elusion time from chromatograph, its quantity by a theoretical calculation based on area under titration curve and percent chlorine in molecule.

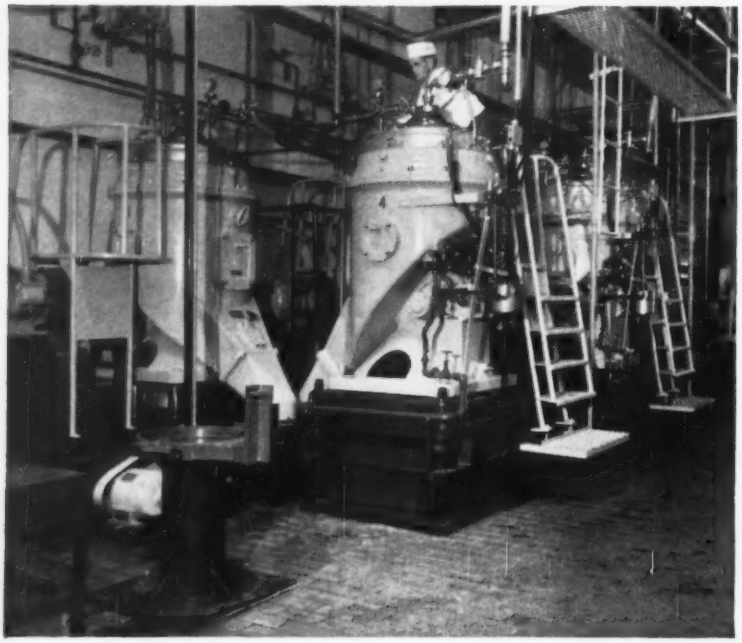
Although most of the work to date has been done with pesticides, system should find wide applications in such areas as food additives and flavor constituents. — *L. V. Cavanagh, D. M. Coulson and J. E. DeVries, Stanford Research Institute, Menlo Park, Calif.*

Lye Coating-Pressure Steam Cuts Potato Peeling Losses

Peeling potatoes and other root crops by precoating with hot caustic solution, then subjecting them to atmospheric steam under pressure results in smaller product losses than either straight lye- or steam-peeling.

Comparisons were made between the three methods. In straight lye peeling, various caustic strengths, temperatures and exposure times

FLUIDICS* AT WORK



Continuous centrifuging improves juice quality without sacrifice in yield

At Pasco Packing Co., Dade City, Fla., these four Pfaudler Titan centrifuges are the key to producing juice having the high quality of a single light-finish, without any sacrifice in yield.

Under Pasco's new procedure, solids from the first finish are countercurrent-washed four times to recover additional sugar solids. Centrifuging the juice derived from these washings removes unwanted fine solids, detrimental to quality. By eliminating heavy finishing, Pasco no longer presses undesirable ingredients from the pulp. Centrifuging also avoids aeration and thus improves shelf life of the concentrate.

VERSATILITY. Since the Titan can continuously remove pulp from extractor juice with solids as high as *28% by volume,* juice processors have flexibility to meet process changes caused by seasonal variations in the fruit.

The Pfaudler Titan puts 7800 times gravity to work for you. This, along with a choice of disc sizes, makes separation of any size particle up to 1/8" diameter possible. And the Titan operates *continuously,* ejects sludge automatically in 5 seconds or less.

OTHER USES. Processing citrus juice is one application for the Titan's many unusual features. There are others. For example, the "Selecteject" control provides *solids only* discharge while maintaining a sludge blanket at the bowl periphery. This is useful with slimy solids where maximum dewatering or concentration is required. "Selecteject" also lets you handle coarse, compacting, granular solids with instantaneous, complete discharge.

TEST PROGRAM. Let us test your product in your plant with a Pfaudler demonstration unit, or at Pfaudler's Test Center. For information, ask for Bulletin 946. Write our Pfaudler Div., Dept. FE-40, Rochester 3, N. Y.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment, and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.
Specialists in FLUIDICS . . . the science of fluid processes

were tried. This was also done with the combination method. In addition, different steam pressures and exposure times were tried with this method.

Best results were obtained by immersing potatoes 5 min. in 5% lye solution, then exposing them for 30 sec. to 90 psi. steam. Peel loss by this method was 12.3% compared with 18.6% for steam and 22.4% for lye.—*Food Tech.*, 1-3, Jan., 1960.

Malt Syrup Media Is Best For Cultured Mushrooms

A systematic study of submerged growth of *A. campestris* strain NRRL 2334 mushroom showed that maximum flavor and aroma developed in a malt syrup medium containing a trace of yeast extract solids. Extracts of malt sprouts could replace the malt syrup. Cane molasses was not a favorable medium for development of typical mushroom flavor.

The pH of medium was not critical—growth was equally good at pH 5.0 and 7.0. Optimum sugar concentration is 2.0—3.0% or 2.3% glucose, at which yields of 38-48% were obtained. Carbohydrate to nitrogen ratio of 20:1 to 30:1 is desirable for good efficiency.—*Applied Microbiology* 8 (1), 63-7, 1960.

Preparation and Uses Of Frappes in Candies

Foamy masses used in marshmallows, nougats, light toffees, and similar articles, may be divided into: (1) Whips (up to 55% solids, density 0.20, stable for only a few minutes); (2) one-day frappé (65-75% solids, density 0.35, stable for about 8 hr.) and (3) standard frappé (over 80% solids, density 0.50, stable for a week or more).

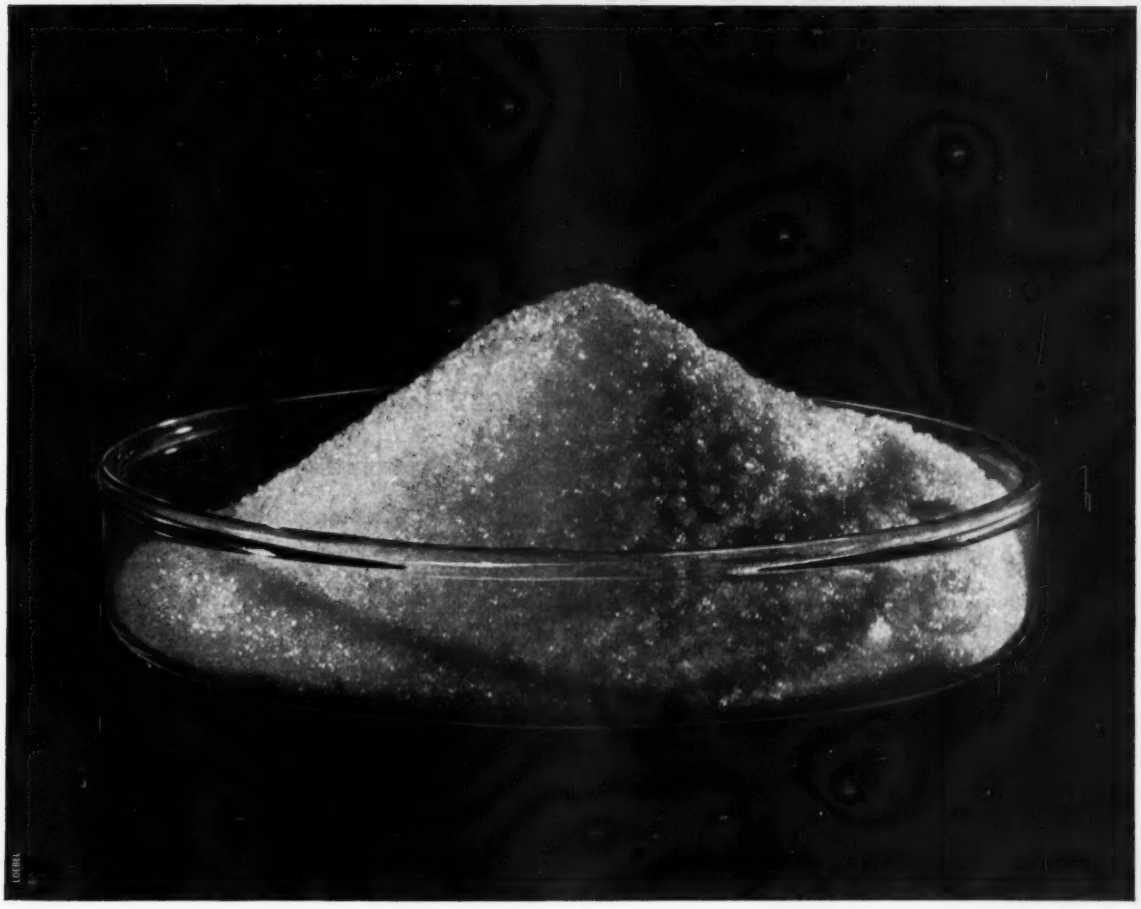
Egg albumen and other whipping agents provide foaminess, sugar the extra solids. Both density and stability go up with solids. Both whips and frappés can be blended with other ingredients to make final candy batch.

In final mixture: (1) Decreasing water content causes loss of air and increases density; (2) high solids, high density frappé leads to less loss of volume and a lighter batch; (3) low water and long mixing leads to higher density and (4) fat additions increase density.

Frappé of minimum density is obtained by beating with air under pressures up to 45 psi. Time of prep-

Now—one high-purity salt is ideal for virtually all foods made today. The salt is Sterling Purified Salt, always more than 99.9% pure sodium chloride (less than 30 ppm calcium and magnesium, less than 0.2 ppm trace metals). Meat packers prefer it for a wide variety of operations, including curing, pickling, flavoring—and find it compatible with all phosphates. Canners like the way Sterling Purified Salt always protects food flavor, color and texture. Bakers use it in preparing the sponge. Food processors find it eliminates any problem of oxidative rancidity in vegetable fats and oils caused by ordinary salts. The list could go on indefinitely—for Sterling Purified Salt is today's superior salt, the salt that consistently upgrades fine products. Try it on your lines. To order, contact International's local representative or the nearest district office: **Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis.** Or write direct to International Salt Company, Clarks Summit, Pa.

NEW STANDARD OF SALT PURITY



INTERNATIONAL STERLING SALT SALT COMPANY

"A STEP AHEAD IN SALT TECHNOLOGY"

CIRCLE 107 ON READER SERVICE CARD 107

This is Why the Nash is the Most Simple Compressor

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature automatically maintained.

Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

NASH ENGINEERING COMPANY
313 WILSON, SO. NORWALK, CONN.

aration is also reduced by pressure method. Both continuous and non-continuous beaters are available. Former with capacities to 7000 kg./8 hr., latter 500-2,000 kg.—*Int. Choc. Review*, 14(12), 536-39, 15(1), 14-17.

Pitting of Aluminum Sped By Presence of Copper

Aluminum tanks and utensils exposed to some water supplies can become severely pitted if they are not cleaned regularly.

When aluminum test pieces (4x8 cm.) were exposed to 75 different "synthetic" hard waters, only those containing calcium bicarbonate, sodium chloride, and dissolved copper caused nodular pitting. Maximum weight loss occurs when Ca^{++} content was 50 ppm., irrespective of chloride content.

A sealed (by boiling water) anodized film (0.2 mm. thick) on the aluminum surface is effective in preventing pits. Removal of this film intensifies pit formation.

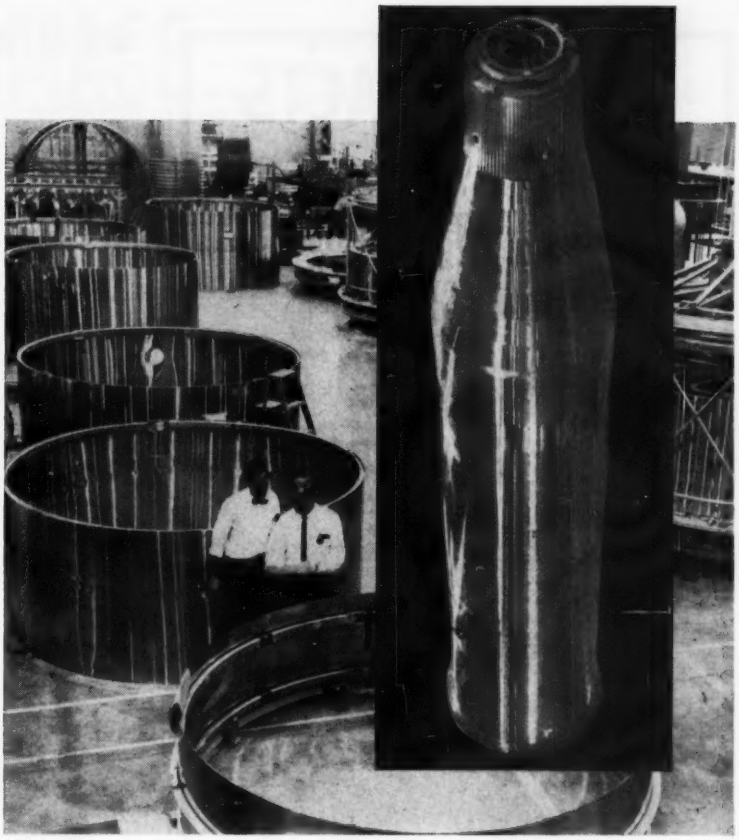
Aluminum surfaces have a protective film on them, some areas of which are weaker than others. At thin spots Cu-bearing water penetrates to pure metal, Cu is deposited, a cathodic reaction occurs and continues until nearly all of it disappears from the water. Bicarbonate ions maintain acidity necessary for a pit to develop.—*J. Applied Chem.*, 9(12), 651-60, 1959.

Antioxidant Properties Of Tocopherols Cited

Tocopherols are important for their vitamin E activity and ability to protect unsaturated fats from oxidation.

Seven methylated tocols, as well as the parent, unmethylated tocol, have been isolated or synthesized, and their antioxidant properties investigated. The three unsubstituted in the 5-position (δ, γ, η) were most effective in delaying destruction of carotene in mineral oil at 170F.

In delaying peroxidation of methyl esters of lard fatty acids at 195F., δ-tocopherol (8-methyl tocol) was most effective, α (5, 7, 8-trimethyl tocol) the least. At 123F., γ (7, 8-dimethyl tocol) was most active in delaying absorption of oxygen by methyl linoleate, α the least. Tocopherols were less effective in protecting lard esters exposed to light.—*J. Sc. Food & Agr.* 10(10), 537-48, 1959.



"the life of an ATLAS tank section begins in the town of Washington, Pa.

. . . where the Washington Steel Corporation produces thin-gauge Stainless Steel in long, flexible bands about a yard wide."*

Washington Steel Corporation is the exclusive supplier of stainless skin for the ATLAS program for a very good reason: it has been able to meet the exacting specifications laid down for this specific undertaking.

Washington Steel Corporation is the pioneer in precision-rolling of light gauge stainless sheets by the Sendzimir process.

*ATLAS—The Story of a Missile
by John L. Chapman, ©1960

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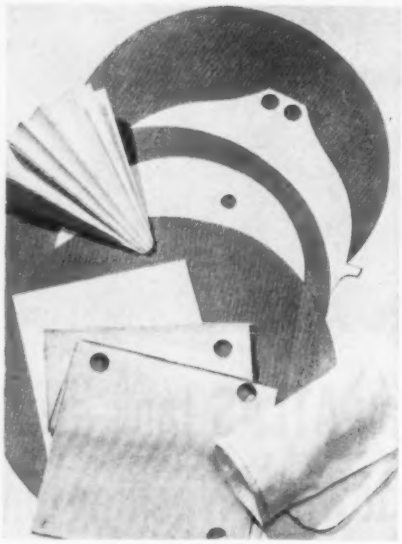
4-W WOODLAND AVENUE WASHINGTON, PA.

CIRCLE 109 ON READER SERVICE CARD 109

GET THE FACTS
ON WHY
100s of FOOD PROCESSORS and MANUFACTURERS use "FILPACO" FILTER MATERIALS



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MEN & COMPANIES

Seek New Outlets . . . In an effort to find new industrial markets for agricultural commodities, especially those in surplus, USDA has created a position of Co-ordinator for Utilization Research.

Named to this post by Secretary Benson is Dr. Roy Chester Newton, recently retired research v.-p. for Swift and Co.

"Dr. Newton's intimate knowledge of industry needs for raw materials of food, fiber, and especially industrial products, will be particularly valuable," states Mr. Benson.

The position holds responsibility for continuing review of all utilization R&D work, including that financed by Federal grants, as well as under contracts and grants at institutions in the U.S. and abroad.

Dr. R. C. Newton

Dr. Newton is a former college instructor and a past president of IFT and the Agricultural Research Inst. Memberships include the American Chemical Soc., National Research Council, Nutrition Foundation, and American Inst. of Chemists.

Dr. Roy E. Morse

Strengthen Research Team . . . Named asst. directors of research at Thomas J. Lipton are Dr. Roy E. Morse and Edward Seltzer.

Dr. Morse is former chairman of the Food Science Dept. at Rutgers University. He has developed several commercial processes for the food industry, including high speed fat rendering, electrostatic smoking of bacon, and meat curing techniques. His special research areas have been in meat, yeast, vegetables, fruits, and edible oils.

Mr. Seltzer moved up to chief research engineer at Lipton. Joining the firm in 1946, he has served on an advisory committee for the U.S. Quartermaster, Food & Container Div. and was recently appointed chairman of the Committee on Fruit & Vegetable Products.

Edward Seltzer

Personnel

Louis B. Breving succeeds the late **Hugh W. Griffiths** as manager of frozen products department, Fleischmann Div. of Standard Brands, Inc.

Frederic J. Janssen is now chief candy technologist in technical services dept. at American Molasses Co.

Robert H. Comfort takes over executive v.-p. post at Borden Co.'s Pioneer Ice Cream Div.

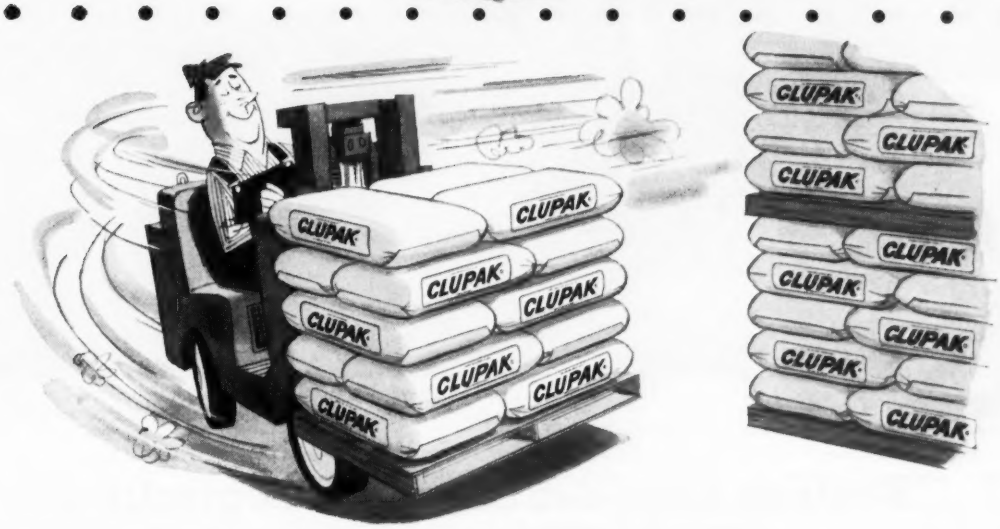
James D. Cooney is new board chairman and chief executive officer at Wilson & Co. Former Fresh Meat Group Manager **R. G. Haynie** assumes duties of president and chief administrative officer.

W. F. Edwards, Pasco Packing Co., is new president of National Assn. of Frozen Food Packers.

Harold L. Franklin, former market research director for Seabrook Farms, joins marketing staff at Penn Dairies, Inc.

H. S. Gabbert assumes manufacturing superintendent post for General Mills' Sperry

END BAG DAMAGE... use multiwalls made of CLUPAK* extensible paper!



NEW, TOUGHER KRAFT SOLVES BREAKAGE PROBLEMS

New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK extensible paper in your kraft bags, you solve your breakage problems once and for all. And multiwalls of CLUPAK extensible paper fill faster, palletize better and handle easier.

Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK extensible paper, as part of your next bag order. Use the CLUPAK trademark when ordering and look for it on the bags. Only then can you be sure the bag paper meets the rigid strength specifications established by Clupak, Inc. for your benefit.

*Clupak, Inc's. trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

One of 38 Foxboro Cam-Set Schedule Controllers used to control temperature of fermenting tanks at the Pabst Brewery, Newark, New Jersey.

Foxboro Cam-Set Schedule Controllers protect the uniformity of Pabst Blue-Ribbon Beer

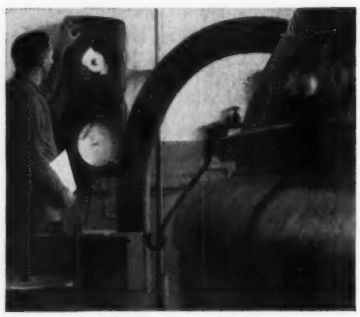
Ever wonder how they do it? Make every bottle of Pabst taste the same, look the same . . . batch after batch after batch. Experienced brewmasters — special yeasts are part of the answer. And strict control over time and temperature of fermentation are the rest.

For this strict control, Pabst Brewing Company, Newark, New Jersey, depends on Foxboro Cam-Set Schedule Controllers.

Here's how they do it. Operator installs proper cam for fermenting cycle, sets controller at "start," and that's it. Then, Foxboro takes over — automatically advancing tank temperature; automatically circulating refrigerant through tank coils when temperature of fermenting wort starts to rise. And when the cycle is complete, the operator has a continuous chart record of the whole process.

Foxboro Cam-Set Program Controllers deliver perfect uniformity, perfect repeatability, batch after batch. No wonder every bottle of Pabst tastes and looks the same.

If continuous temperature control is a problem on your food process ask your Foxboro field engineer about the Cam-Set Controller. Or write for engineering data sheet 208-3. The Foxboro Company, 304 Neponset Avenue, Foxboro, Mass.



Two-case Foxboro Cam-Set Schedule Controllers are used on mesh and cereal cookers at the Pabst Brewery. Two-case instrument allows changing charts without touching the cam.

FOXBORO
REG. U.S. PAT. OFF.

Operations in western states.

T. M. Glen is now manager of manufacturing at Seabrook Farms Co.

John B. Harris fills new post of director of industrial operations at United Fruit Co.

Howard E. Lemmon, Sacramento Freezers sales manager, is new president of California Freezers Assn., formerly Western Frozen Food Packers Assn.

Angelo Maneri is new plant engineer at Buitoni Foods Corp.'s South Hackensack, N. J., plant.

John A. Moser, Louisville, Ky., area dairy leader, is new board chairman of National Dairy Council.

John S. Phillips, Puritan Preserve Co. president, assumes presidency of National Preservers Assn.

E. J. Roberts, Crowley's Milk Co., is new president of Dairy Products Improvement Inst.

A. J. Claxton, Beatrice Foods Co., is v.-p.

Dr. Wallace R. Roy, technical services v.-p. at Minute Maid Corp., has been elected chairman of Refrigerated & Frozen Products Research Advisory Committee of USDA.

Dwight L. Stuart, former asst. sales v.-p. in Carnation Co.'s Grocery Products Marketing Div., is now a director.

Clifford C. Sutton moves up to packaging development manager for Quaker Oats Co.

Harold M. Williams, Hunt Foods & Industries director and former finance v.-p. is now executive v.-p. Further, **Stella Russell** and **Ralph F. Baxter** are named to v.-p. ranking.

Edward J. Taylor fills v.-p. post at Arnold Bakers, Inc.

Industry

Archer-Daniels-Midland Co.'s new Prochem Div. is handling production and marketing of soy proteins and flours and industrial cereals. Move is prompted by growing importance of protein energy derived from soy products.

Beech-Nut Life Savers, Inc., and **General Milk Co.** have agreed to jointly manufacture baby food on international basis. Line will be produced at Bad Essen, Germany, marketed under Glucksklee label, and distributed mainly in European Common Market. Plant will also produce line of Beech-Nut chewing gum.

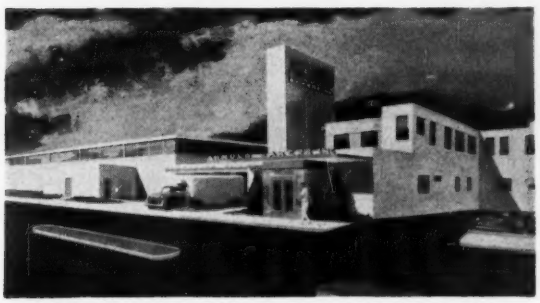
Cargill, Inc., expects to increase soybean oil and protein meal production by 50% with a new processing plant at South Norfolk, Va.

Central Soya Co.'s new Chicago plant will increase research and pilot work on edible proteins, mainly promine.

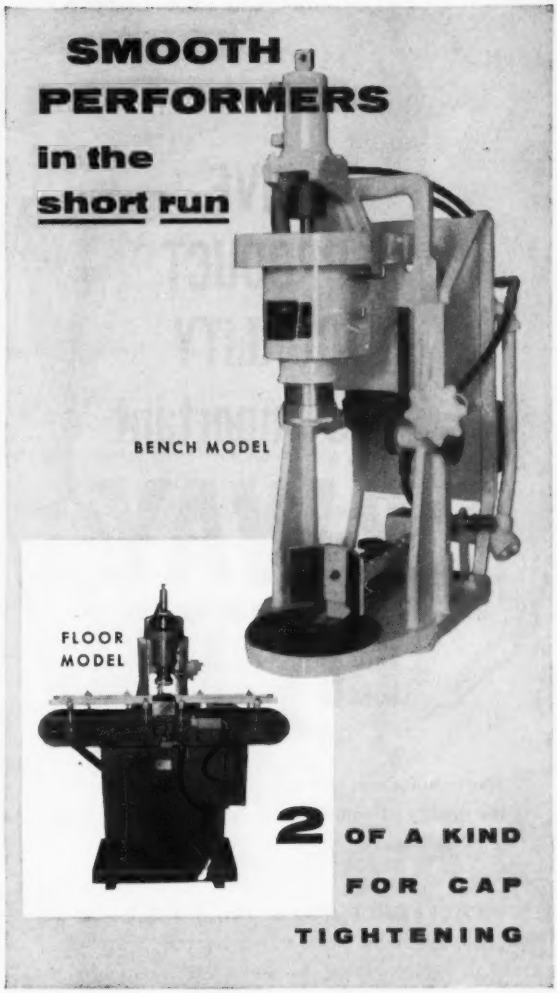
Cook Coffee Co. plans 1960 opening of a modern ice cream and milk plant in Maple Heights, Ohio, in addition to announced bakery expansion in same city.

Gateway Flakes, Inc., is completing $1 million potato-processing plant in Barnesville, Minn.

General Foods Corp.'s Birds Eye Div. will build a 180,000



FALL COMPLETION is expected for this multi-million dollar plant of Arnold Bakers, Inc., Port Chester, N. Y. The 1-story, 82,500 sq. ft. building will be attached to the present bread bakery and offices and is designed for straight-line production by mechanical or pneumatic conveyor systems.



Each of these Unicappers—bench or floor—requires the assist of one operator who feeds the container, with the cap loosely placed on, in position to be automatically tightened to uniform tension. The tightening chuck is driven down to contact the closure by air cylinder action. Both machines handle screw or lug type turn-on caps and container sizes up to 7" in diameter. Adjustable to height range from 2" to 10". Adjustable tension, quick, easy change-over from one size to another.

Mail the coupon and get the full facts on these two versatile low cost machines.

another SEMI-AUTOMATIC by PNEUMATIC

Carbert Mfg. Co., Dept. 91, Division of Pneumatic Scale Corp., Ltd., 143 Sidney Street, Cambridge 39, Mass.

Please send us complete information on Unicapper.

NAME_____ Position_____

COMPANY_____

ADDRESS_____

CIRCLE 113 ON READER SERVICE CARD

Sheftene Sodium and Calcium Caseinates improve the quality of your product line in either, or both, of these basic ways:

I

SHEFTENES are a source of high-quality milk proteins, with an abundance of lysine and tryptophane. As such, they are unsurpassed for improving the protein quality of foods—wheat and grain products particularly.

II

SHEFTENES are versatile *functional* ingredients. They are used — efficiently and economically — to enhance the texture, appearance and shelf-life of bakery, cereal, dairy, meat products, beverages, infant foods and many others.

SHEFTENE products come in powder form, are soluble and possess no marked flavor or odor characteristics of their own. Write today for samples and technical data to Dept. FE-460.

SHEFFIELD CHEMICAL
Norwich, N.Y.
A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION

Western U.S. distribution through
Van Waters & Rogers, Inc. — Seattle, Spokane, Portland, Dallas, Houston
Braun-Knecht-Heimann Co. — San Francisco, Salt Lake City, Denver
Braun Chemical Company — Los Angeles, San Diego, Phoenix, Albuquerque, El Paso

sq. ft. processing and refrigeration plant in Canadaigua, N.Y., to produce its new line of Frozen Instant Baby Foods.

Theo. Hamm Brewing Co. has purchased the **Gunther Brewing Co.**, Baltimore.

Orange Crush Co., Evanston, Ill., has changed its name to **Crush International, Inc.**, with view to continuing overseas expansion.

Associated Industries

Girdler Process Equipment Div. of Chemetron Corp., Louisville, Ky., has established a San Francisco office for West Coast sales of Votator continuous-process equipment, headed by John H. Scott. Charles B. Skinner is new Girdler plant manager (not John E. Slaughter Jr., as erroneously reported here last month). It was Div. President Slaughter who announced Mr. Skinner's promotion.

Hoffman-La Roche, Inc., Vitamin Div. has been renamed Fine Chemicals Div.

Pacific Intermountain Express, Oakland, Calif., and **U.S. Leasing Corp.**, San Francisco, announce plans to consolidate.

Packaging Corp. of America will establish corporate headquarters in Evanston, Ill.

Pneumatic Scale Corp., Ltd., Quincy, Mass., has named Kendall D. Doble, Jr., as president, succeeding his late father.

Sonneborn Chemical & Refining Corp. has established an information center to answer Food Additives Amendment inquiries from users of petroleum products.

Vulcan-Associated Container Cos., Inc., is a new firm formed by merger of seven container manufacturers. Headquarters are in Birmham, Ala.

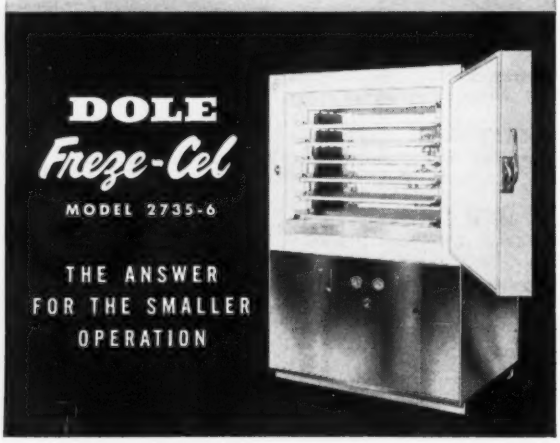
Deaths

Timothy Mojonnier, 83, founder and board chairman, Mojonnier Bros.

John W. Rose, 62, vice-president, Libby, McNeill & Libby.

Edwin K. Daly, 63, president, Horn & Hardart Co.

NEW! COMPACT, SELF-CONTAINED DOUBLE CONTACT FOOD FREEZER!



6-Station unit: 240—5" x 4¼" packages per freeze . . . all refrigeration and hydraulic equipment self-contained . . . uses R22 refrigerant . . . only 17 sq. ft. of floor space required . . . patented DOLE "Thermo-Film" feature increases freezing speed up to 10% . . . installation requires only electrical, water and drain connections.

DOLE REFRIGERATING COMPANY
5950 NORTH PULASKI ROAD, CHICAGO 46, ILL.
103 PARK AVENUE, NEW YORK 17, N. Y.
Canada: Dole Refrigerating Products Limited, Oakville, Ont.

A cinch in a pinch...
NEW DODGE CAB-FORWARD

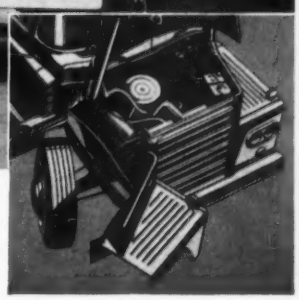
Dodge Cab-Forwards handle with ease, even where back-in space is tight. There are many reasons: compact 89¾-inch bumper-to-cab-back dimension; short wheelbases; tight turning diameters; wide front tread; easy steering . . . manual or power.

In other ways, too, you'll find Dodge has a talent for keeping your driver efficient and at ease. There's the roomy cab with fully adjustable coil-spring seat, easy-to-read instruments and easy-to-reach controls. There's quick acceleration in big Dodge V-8 engines; quick stopping with giant Dodge brakes. Dodge works *with* your driver, never against him, every mile and minute of every hauling day. And Dodge has the right truck for you . . . whether new Cab-Forward or conventional model . . . truck or tractor . . . gas or diesel.

See your Dodge truck dealer. It's a cinch you'll discover you can

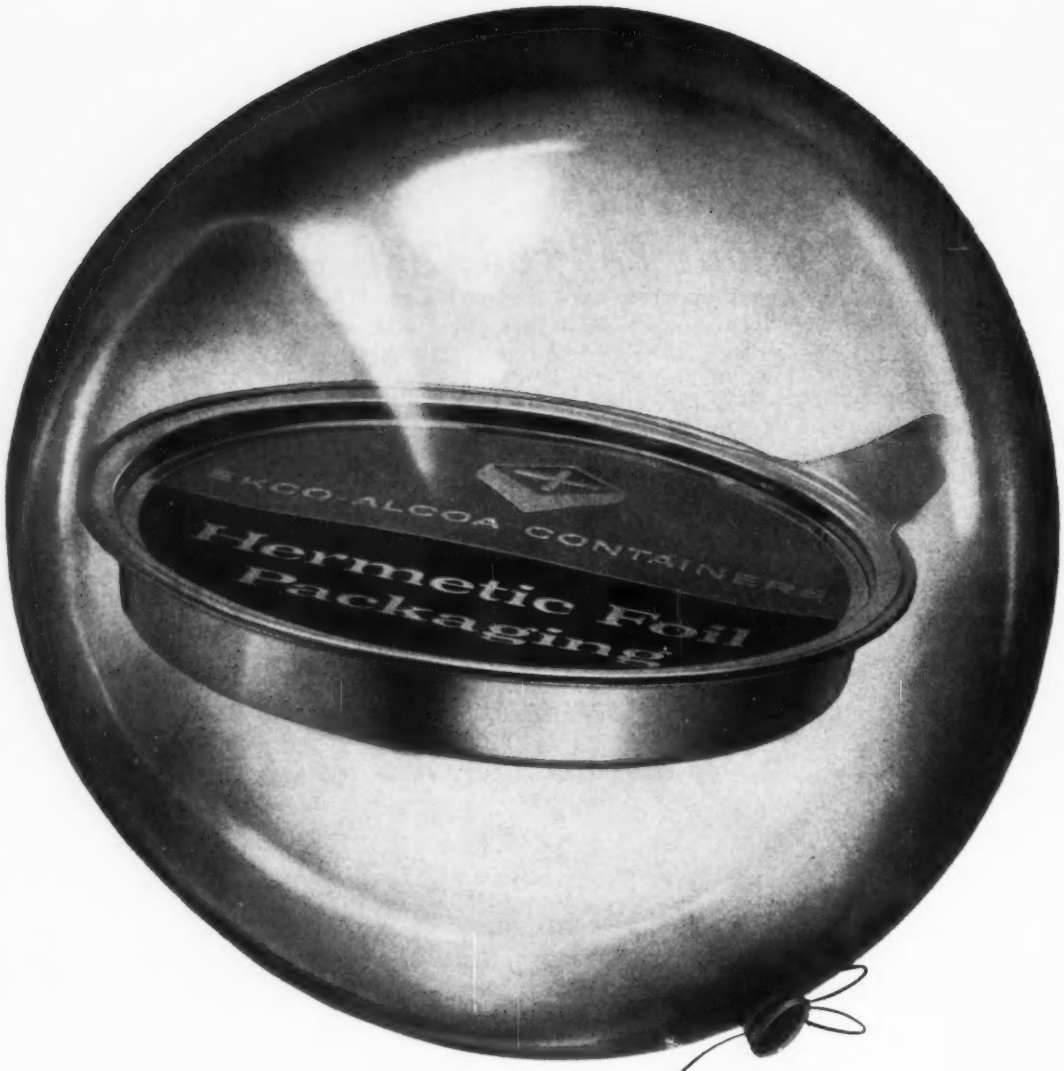
DEPEND ON DODGE *TRUCKS*

TO SAVE YOU MONEY IN



Servi-Swing Fenders—You pull a latch and out swing these sturdy Dodge fenders, exposing the engine for quick, easy service to reduce labor costs. Never has an engine been so easy to reach in a cab-forward truck!

A PRODUCT OF CHRYSLER CORPORATION



... it's air-tight, too!

. . . the first and only aluminum foil container with a true hermetic seal. Neither air nor moisture can penetrate this new Ekco-Alcoa Smoothfoil package. Keeps moist products moist, dry products dry. Protects products which have a tendency to mold or become rancid. Eliminates insect infestation and the sifting of powdered products.

Tops in convenience and beauty, too. Simple pull tab cover opens the package . . . no keys or can openers required. Easy to serve from. Available in natural aluminum or lustrous, distinctive colors.

Economical Smoothfoil comes in many shapes and sizes, covering a broad range of packaging possibilities. For full information, write . . .

The Plus Container

EKCO-ALCOA CONTAINERS INC.

WHEELING, ILLINOIS · WHITTIER, CALIFORNIA · LONG ISLAND CITY, NEW YORK

EKCO is the registered trademark of Ekco Products Company; ALCOA is the registered trademark of Aluminum Company of America. The corporate name and combination mark, EKCO-ALCOA, is used under license to the manufacturer by each of these companies.

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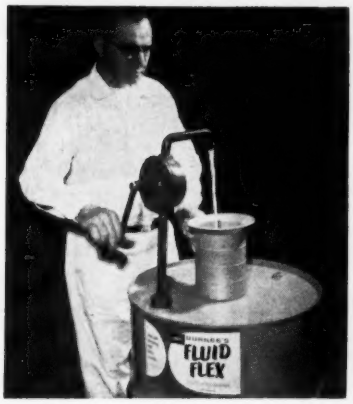
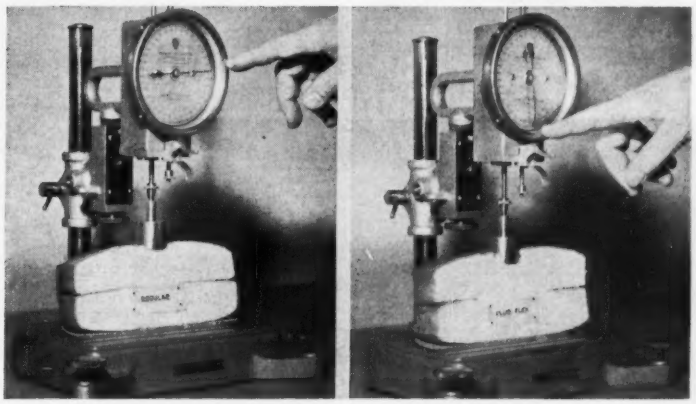
NEW EQUIPMENT & SUPPLIES





Handling (left) is easier, faster, more precise. And in penetration test on 3-day-old cakes, liquid-shortening product (right) shows superior freshness.

Liquid Shortening: It Ups Cake Quality, Cuts Costs

Improved texture and extended shelf-life for cakes and yeast-raised sweet doughs are reported with use of a liquid vegetable shortening newly developed for the baking field.

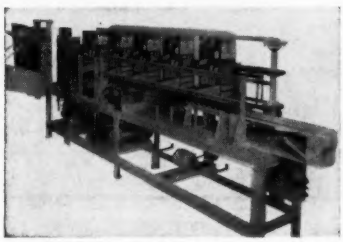
Key feature of pourable ingredient, Durkee's Fluid Flex, is the "Micro-mulsifier (glyceryl lactostearate) that rapidly disperses in batters to give greater yield and softer texture.

Maker cites cost savings through faster measuring, reduced creaming time, less waste, and elimination of tedious scooping from drums.

Revolutionary product, gaged at 0.92 sp. g., can be pumped, metered, or measured directly into a batch, using any liquid bulk-handling system. And with same stability as a top quality vegetable oil, it can be delivered in drums, tanks, or 10-qt. cans.

Reportedly, its use requires no basic formulation change, although it may be necessary to increase amounts of water or milk for optimum results, depending on nature of other batch ingredients.—*The Glidden Co., 900 Union Commerce Bldg., Cleveland 14.*

Circle 300 on Reader Service Card



Sets Up Big Cartons

Continuous-motion carton machine of new series automatically sets up containers as large as 12x8x20 in.

Action includes 180-deg. reversing of carton and ironing of score lines to provide container fully squared before gluing. With bottom flaps folded square and flat after gluing, cartons may be conveyed directly to filling unit.

Machine uses only three cams. Self-contained vacuum system includes pump and non-jam valve. Glue pot is removable for easy overnight cleanup.

Maker offers a sealing unit of similar construction—made available for use in line following filler.—*Thiele Packaging Machinery, 1000 Berry Ave., St. Paul 14, Minn.*

Circle 301 on Reader Service Card

Batch-Time Controller

Automatic regulation of either temperature or pressure for batch-type operations is afforded with new pushbutton elapsed-time controller.

Charts' ranges run from −100 to 1,000F., and thermal systems are supplied for industrial applications.

In operation, red signal light indicates start of process, and green light notes beginning of timed cycle. Both lights go out at end of pre-set period.—*Weston Instruments Div., Daystrom, Inc., 614 Frelinghuysen Ave., Newark 12, N.J.*

Circle 302 on Reader Service Card

Want more information on any items? Just circle the key numbers on Reader Service Card, back of book

FOOD MIXES

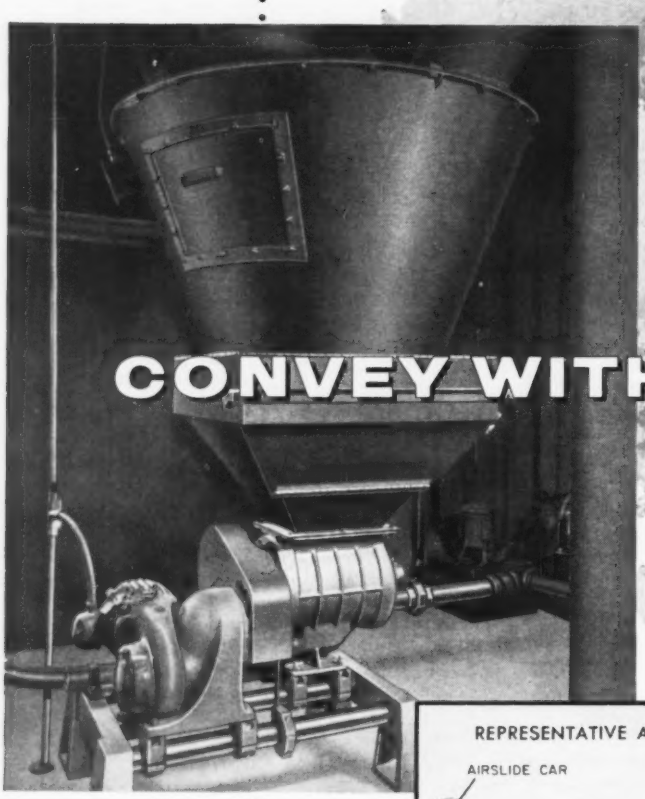
INSTANT COFFEE

STARCH

SUGAR

FLOUR

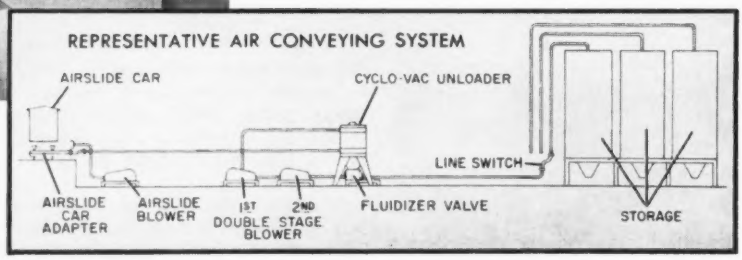
REDUCE COSTS



CONVEY WITH AIR

BENEFITS:

- Significantly lower handling costs for any powdered or granular material. Average savings: $3.60 to $6.10 per ton.
- Buy in bulk—eliminate cost of individual containers
- Free valuable space and working capital
- Completely sanitary system



Most Advanced in Modern Air Handling

Fluidizer®

THE FLUIDIZER COMPANY, A DIVISION OF SUPERIOR SEPARATOR CO.

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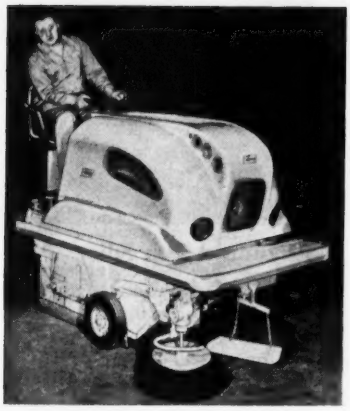
Baltimore—1223 Northern Pkwy. (Sherwood House) ID 5-5524
Buffalo (Orchard Park)—25 E. Quaker St. ID 3985-6
Houston—P. O. Box 654. HO 5-5084
Los Angeles (Pasadena)—919 E. California Blvd. MU 1-9766
Louisville (Jeffersonville)—204 Rosewood WH 4-0512
Omaha—5101 Blondo St. GL 3803
Philadelphia (Bryn Mawr)—26 Summit Grove Ave. LA 5-6261 LA 5-8699
Roanoke—P. O. Box 706. DI 5-7442
St. Louis—5850 Delmar Blvd. PA 6-1492
San Francisco (Daly City)—375 S. Mayfair Ave. PL 5-8256
Seattle—1331 Third Ave. MU 2-6195
Spokane—1324 N. Ash. FA 7-6624
Ft. William, Ont.—430 Waterloo St. 27733
Montreal—P. O. Box 1043, Station "O" RI 4-4967



Simpler Power Sweeper

Hydra-Sweep, new compact sanitation unit, operates with special sealed hydraulic drive system that provides new simplicity in control and chalks up maintenance savings.

With omission of conventional transmission, clutch, and drive chains, a single pedal controls forward and reverse movements, speed changes, and hydraulic braking. Side broom retracts up to 6 in. when it hits any obstacle, thus reducing gutter broom damage. Hopper bottom is 3 in. off floor, will pick up pieces of 2x4-in. angle iron, rocks, paper clips, bottles, etc., without humping sweeper or pivoting hopper.

Turning radius is only 53½ in. An 18-hp. motor powers system.—*The Hydra-Action Co., 2032 W. Schaff Rd., Cleveland 9.*

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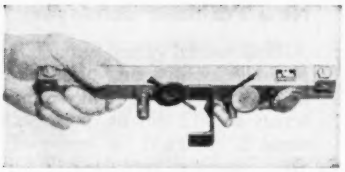


Clean-or-Guide Magnet

Magna-Bar is new non-electric magnetic unit (employs ceramic-type energized barium ferric oxide) that is particularly powerful and versatile. It can be used in rigs for gleaning tramp iron (photo) or incorporated under conveyor belts for holding and guiding the movements of metal containers. Of 1x1 in. cross-section, bars are offered in lengths running from 4 to 72 in.—*Eriez Mfg. Co., Erie, Pa.*

Circle 304 on Reader Service Card

I-E Chromatograph Papers

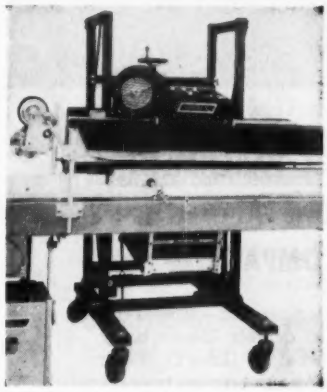
For new selectivity and capacity, ion-exchange resins are combined in new Amberlite chromatograph papers.

Developed for superior performance in analysis and research, these papers have excellent uniformity and good physical wet strength. Additional possibilities are seen in special type processing, also filtering operations.

Each sheet contains 50% fine-particle resins supported by alpha cellulose pulp fiber. Four different grades are: SA-2, strongly acidic in sodium; WA-2, weakly acidic in hydrogen; SB-2, strongly basic in chloride; and WB-2, weakly basic in free-base form.

Sizes offered are 9x12-in. and 8x11-in. A trial pack of four 8x11-in. sheets of each type is also being marketed.—*Rohm & Haas Co., Washington Sq., Philadelphia 5.*

Circle 305 on Reader Service Card



Codes Film-Wrapped Goods

Automatic code marking of polyethylene-wrapped rolls, bread, and other soft goods is achieved with this unit that easily fits, as shown, to packaging-line conveyor.

Free-riding, friction-action coder (Kiwi) prints up to 4 digits and operates under normal high-speed production.

Attachment has wheel (5¼-in. dia.) fitted with 6 marking heads, each having 4 adjustable markers carrying digits 1-9.

Synchronized ink wheel supplies special non-smudge ink for use on the poly.—*Amsco Pkg. Co., 31-31 48th Ave., Long Island City 1, N. Y.*

Circle 306 on Reader Service Card

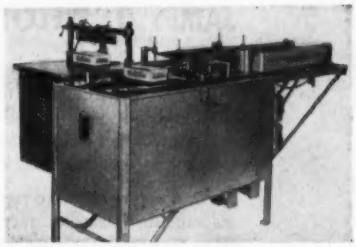
Tight-Aisle Lift Truck

Right or lefthand warehouse stacking within restricted 6-ft. aisles is easy with "Naro-Aisle Stack" truck.

Entire front end pivots full 180 deg., permitting pickup or stacking on either side. Layouts providing up to 50% more storage capacity are seen feasible through new unit's saving in aisle space. Thus, a 200x400 ft. building could encompass up to 16 extra rows of storage area.

All horizontal movements of truck are controlled by single foot pedal without shifting. Other features include low-profile contour, full-vision instrument panel, 70/min. lifting speed, and exclusive "Cool Flow" exhaust system.—*Towmotor Corp., 1226 E. 152nd St., Cleveland 10.*

Circle 307 on Reader Service Card



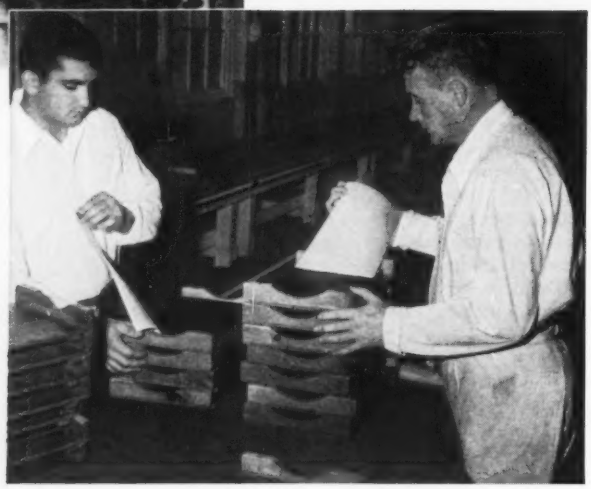
Semi-Automatic Wrapper

Compact (54x78 in.) Model EZB semi-automatic wrapping unit is motor-driven, foot-treadle control machine designed for film, wax paper, and foil packaging.

Suitability is cited for handling such items as candy, baked goods, ice cream, nuts, and frozen food products. Various-size packages are handled, and there is full adjustability for underfolding, overwrapping, and heat sealing.—*Elgin Mfg. Co., Elgin, Ill.*

Circle 308 on Reader Service Card

Hot Fudge... then *Quick* Release



Patapar® VEGETABLE PARCHMENT SMOOTHS OPERATIONS AT JAMES O. WELCH COMPANY

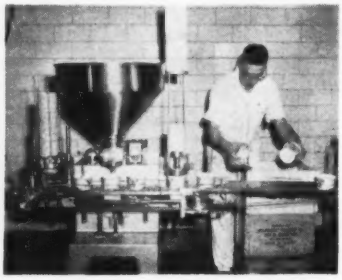
Over 3,000,000 pounds of fudge per year—at temperatures ranging from 140 to 180 degrees F.—are being poured upon Patapar-lined tables at the James O. Welch Company, Cambridge, Mass. And, necessarily, each batch separates easily and cleanly after cooling.

Patapar was selected to replace a waxed kraft because of its superior release characteristics, economy and purity. This Vegetable Parchment has a dense, fiber-free surface which cannot, by its nature, adulterate the fudge. Other inherent characteristics of Patapar provide high strength and resistance to penetration.

If you have an operation requiring quick release, purity, and resistance to penetration by fats, sugars, oils, or moisture, you're welcome to samples of Patapar. Send for free information and sample package of Patapar Releasing Parchments.

"Something Special in Papers"

PATERSON PARCHMENT PAPER CO.
BRISTOL, PENNSYLVANIA
Sales Offices: New York, Chicago • West Coast Plant: Sunnyvale, Cal.



Advanced Cup Filler

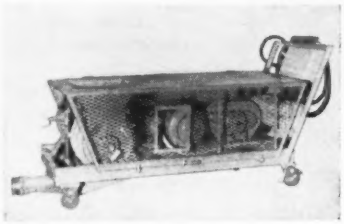
New filling and capping equipment handles a full range of nesting-type round cups from 8 to 32 oz.

Large model (photo) has 20-gal. hopper and variable speed drive. In addition, there is gravity-fill unit without hopper, also two economy models for individual requirements (equipment optional).

All four allow easy operation changeover, and minimum of working parts saves on maintenance.

Machine readily handles cottage cheese, sour cream, snack dips, whipped butter, potato salads, gelatins, cooked beans, etc.—*Anderson Bros. Mfg. Co., 1907 Kishwaukee St., Rockford, Ill.*

Circle 309 on Reader Service Card



New Portable Conveyor

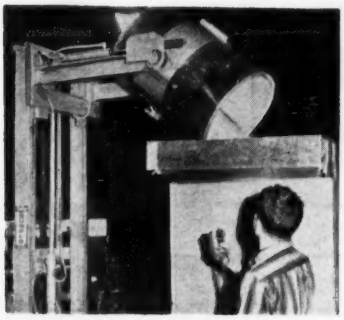
Tradenamed Pneu-Flo 10, new portable positive-pressure conveyor handles free-flowing lightweight materials at 8-12 ton/hr. rates. Equipment is designed for conveying in 40-ft. range.

Maker calls machine ideal for picking up from such units as mixers or bin outlets. Crank adjusts feed rates. —*Sprout-Waldron & Co., 130 Logan St., Muncy, Pa.*

Circle 310 on Reader Service Card

A.P.V. Makes Evaporator

Maker of the revolutionary plate evaporator described in March FE (p. 60) is A.P.V. Co., Inc., Buffalo, N. Y. A typographical error in article transposed two letters in the name. —*The Editors*



Remote-Control Dumper

This portable Tubar dumper empties drums at any height to 72 in., completely inverting loads to 750 lb. Other models afford heights to 110 in.

Feature is remote control permitting operator to start or stop hydraulic dumping mechanism from any vantage point.

New quick-clamp securely holds drum. Option is fluid drive that makes unit a "walkie."—*Uhrden, Inc., Dennison, Ohio.*

Circle 311 on Reader Service Card

Portable Air Compressor

New piston-type air compressor is portable unit (18 lb.) that plugs into electrical outlet to supply filtered, high-pressure air. It requires no lubrication.

Uses include installation as integral part of original equipment, pressure testing pneumatic or hydraulic installations, remote operations of air equipment, etc.

Compactness is feature, unit measuring only 10 in. long by 5¾ in. wide by 9½ in. high. Motor is ⅛ hp. induction type equipped with 8-ft. cord with thumb switch.

Among accessories available are receiver tanks, pressure switches, regulators, gages, relief valves, moisture traps, and air purifiers.—*Winslow Mfg. Corp., 3695 E. 10th Court, Hialeah, Fla.*

Circle 312 on Reader Service Card

(Advertisement)

WHAT 7 THINGS HAPPENED RECENTLY AT FRICK COMPANY* IN WAYNESBORO, PENNA. ?

7 important things for FRICK *and you:*

1. First of all, on a foundation of our 107 years' experience, our new management has established a growth policy that stresses new product development, quality control, and expansion of field services.

2. New branch offices are being opened and the sales-engineering staffs of existing branches as well as of the home office are being increased.

3. A compressor of new design is being developed. This, like our current dependable line, will handle a variety of refrigerants such as Freon, ammonia, propane, butane and carbon dioxide.

4. A new circulating system using refrigerated sea water has been introduced to commercial fishing fleets, at a saving to boat owners.

5. Completely insulated Shell-Ice makers have been "packaged" for convenient field installation.

6. Service to the growing poultry industry has been highlighted by our new counter-flow-continuous poultry chiller, which uses refrigerated water instead of ice.

7. As part of the growth policy, we are increasing the number of Frick distributors. Some of our distributors have been with us 50 years.

All of which indicates one thing: Frick is "on the move!" If you're passing through Waynesboro this summer, stop in and see for yourself; you'll be able to enjoy our remodeled and air conditioned offices.

FRICK COMPANY
Waynesboro, Penna.

*Pioneers in depend*ability* since 1853: air conditioning, refrigerating; ice making and quick freezing equipment, power farming machinery and portable sawmills.

CIRCLE 121 ON READER SERVICE CARD

FRITZBRO® HARD CANDY FLAVORS IMITATION

IN ALL THE WORLD, THERE ARE NO FINER FLAVORS — AS A GROUP AND FOR THE PURPOSES INTENDED — THAN THESE!

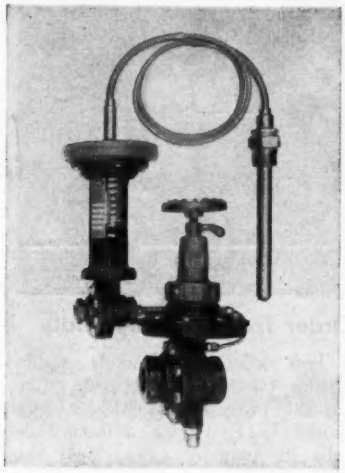
FIFTY DIFFERENT FLAVORING EFFECTS are offered in this much imitated group of powerful, non-alcoholic, high-cook flavors. They are invaluable for use in hard candies, gums and jellies. Since they contain no water or alcohol, they are freely soluble in vegetable oils and therefore provide delicious effects in bon bon and summer confectionery coatings, sandwich fillings and oil base icings. Write for our catalog and/or samples.

FRITZSCHE BROTHERS, Inc.

A FIRST NAME IN FLAVORS SINCE 1871

76 NINTH AVENUE NEW YORK 11, N. Y.

Branch Offices and *Stocks: Atlanta, Ga., Boston, Mass., *Chicago, Ill., Cincinnati, Ohio, Greensboro, N. C., *Los Angeles, Cal., Philadelphia, Pa., San Francisco, Cal., St. Louis, Mo., Montreal and *Toronto, Canada; *Mexico, D. F. and *Buenos Aires, Argentina. **Factories:** Clifton, N. J. and Buenos Aires, Argentina.



Temp-Pressure Controller

Both temperature and pressure are regulated by this single unit—thus eliminating separate installations, simplifying piping, and promoting more direct, less-costly control.

Available in ½-in. to 2-in. sizes, units are suitable for temperatures to 500F. and pressures to 250 psi. They have sliding gate seats that are self-cleaning and self-lapping in operation. — *OPW - Jordan, 6013 Wiehe Rd., Cincinnati 13, Ohio.*

Circle 313 on Reader Service Card

Quick-Weigh Bagging Unit

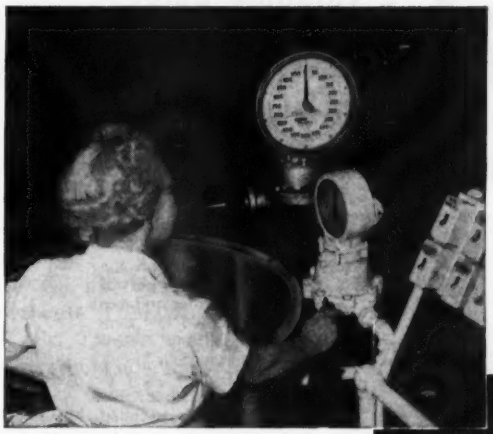
Commodity packaging is sped by this new two-man scale for straight or predetermined weighing. Feature is extra-large pan hinged to tip contents directly into bags or other containers.

One operator fills and checks fast-reading over-under dial; other empties and packs.—*Detecto Scales, Inc., 540 Park Ave., Brooklyn 5, N. Y.*

Circle 314 on Reader Service Card

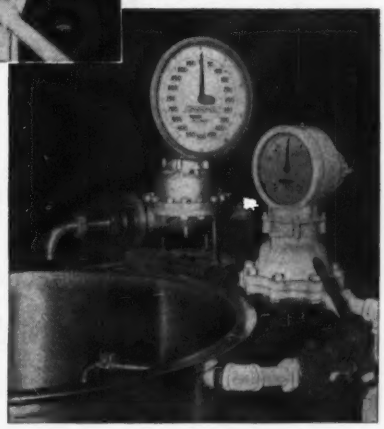
Every Batch of Old Dutch Salad Dressing the Same — in Consistency and Taste

Niagara Displacement Meters insure CONTINUOUS QUALITY



Ingredients of each batch are run in quickly . . . accurately with Niagara Meters in the Old Dutch, Inc. Plant, Blasdell, New York.

Close-up of Niagara Meters showing large vertical registers with easy to read figures for accurate measurement.



Old Dutch Salad Dressing has won wide acceptance for its palate-pleasing piquancy. Safeguarding the ability to maintain this flavor acceptance are two Niagara Displacement Meters, one for measuring the oil and the other the dressing mixture.

Prior to the installation of these Niagara Meters, it was necessary to completely remove all salad dressing from the premix tank before starting another batch. This was necessary because ingredients were measured by the dip stick method.

Now, correct amounts are metered to the tanks by the Niagara Meters regardless of amount of salad dressing left in the tank from previous batch. Result: Faster, accurate preparation of each batch for uniform quality and lower costs.

Let us show you how Niagara Meters can reduce *your* formulating costs. Mail coupon today.

BUFFALO METER COMPANY, Inc.
2910 Main Street, Buffalo 14, N. Y.

☐ Please send me additional information on Niagara Meters.
☐ Please have representative call.

NAME_____

ADDRESS_____

CITY and STATE_____

BUFFALO METER COMPANY
INCORPORATED
2910 Main Street • Buffalo, New York

DAY

Pneumatic Conveying & Bulk Storage News

FREE! 2 valuable guides for selecting PNEUMATIC CONVEYING and BULK STORAGE TANKS

BULLETIN M-588—12 page DAY pneumatic conveying guide just off the press. Discusses types of systems, illustrates and diagrams high and low density arrangements, shows equipment and tells "why" and "wherefore" of all types of pneumatic conveying including so-called fluidizing systems.

BULLETIN 574—12 pages, describes horizontal and vertical storage tanks. Points out savings and is filled with photos of various installations plus description of auxiliary equipment.

Whatever your pneumatic conveying or bulk storage problem, look first in these DAY bulletins. They are valuable aids in selecting and ordering the right equipment for your plant. For your free copies use reader service card of this magazine or write direct toDAY.

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EQUIPMENT ONLY OR A COMPLETE SYSTEM

Equipment & Supplies

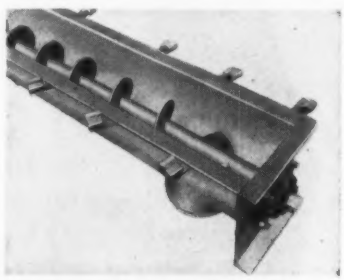
Order Train Rolls by Radio

This order-picker merely pushes button (arrow) on hip-worn radio-control instrument—and his new model UTE tractor automatically rolls its train of cases down the aisle!

Thus, remote control speeds shipping operations by streamlining the performance of picker-and-tractor teams. No need to go back and forth. Picker just radio-beckons trailer from point to point. Then, on completion of order, he can either ride or "walkie" tractor to dock.

Control range is approximately 100 ft. And a number of units can be run in same building, since each has its own frequency.—*Automatic Transportation Co., 149 W. 87th St., Chicago 21.*

Circle 315 on Reader Service Card



Latest Screw Conveyor

Special sanitary features mark new line of stainless helicoid screw and ribbon flight conveyors. Units are offered in 4 to 12-in.-dia. sizes.

Noted in new design are: Outboard mounted bearings with inboard removable mechanical seals or stuffing boxes, hinged drop-bottom troughs held by quick-open clamps, and top covers secured by pivoted "U" type or toggle clamps.

Maker says that dust-tight operation is assured by food-grade hollow core and bead neoprene gasketing.—*The Bucket Elevator Co., Summit, N. J.* Circle 316 on Reader Service Card

JOHNS-MANVILLE ADSORBENTS

Now you can turn to one major source of supply for your speciality adsorbent needs. Johns-Manville introduces Celkate® synthetic magnesium silicates and Micro-Cel® synthetic calcium silicates—first of a new line of adsorbents developed for a wide range of uses in industry.

Painstaking laboratory tests and actual plant operations have proved the efficiency of these adsorbents in removing free fatty acids from vegetable and animal oils, solvents, and lard ... in removing color and odor from lard, edible oils, naphthalene, stearates, and kerosene.

The unusually light color of Celkate and Micro-Cel make them adaptable to countless industrial sorption problems. They provide distinct flavor improvements in the processing of many foods. They are also used in the sorption of soluble iron from glacé syrups.

Next time you need adsorbents or assistance with a related problem, contact your nearby Johns-Manville Celite* engineer first. After studying your problem he can offer specific recommendations or refer it to the Johns-Manville Research Center for additional analysis. Send the coupon for his location and more complete information. You obligate yourself in no way.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JOHNS-MANVILLE JM PRODUCTS

SOME TYPICAL PROPERTIES		
Type	Micro-Cel synthetic calcium silicate	Celkate synthetic magnesium silicate
Color	off-white	off-white
loose weight (lb/cu. ft.)	12.7	13.5
Absorption, % by wgt.	260 (water)	170 (oil)
pH	9.6	7.5
Wet density (lbs/cu. ft.)	17.4	22.5
150 Mesh (residue)	Trace	Trace
Moisture % (free) avg.	6.5	3.5

Johns-Manville, Box 14, New York 16, N. Y.
In Canada: Port Credit, Ontario.

Please send me additional information on the new J-M Adsorbents. I have the following application(s) in mind:_____

_____

_____

_____

Name_____ Position_____

Company_____

Address_____

City_____ Zone_____ State_____

☐ Have a Johns-Manville Celite engineer contact me.

if we have
a specialty...

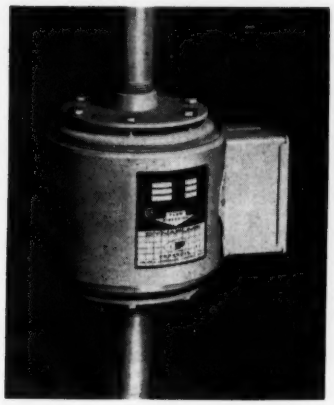
...it's volume
production

It's true that H & D has a reputation for solving thorny packaging problems with imaginative box design. But our real forte is *volume production of regular slotted corrugated boxes*—the kind you probably use to ship your product. In fact, H & D's annual output includes about 225,000,000 of these economical containers. Can you make use of this *specialty* for *volume?*

Hinde & Dauch Division

West Virginia Pulp and Paper

HINDE & DAUCH DIVISION, WEST VIRGINIA PULP AND PAPER, SANDUSKY, OHIO • 17 PLANTS • 42 SALES OFFICES



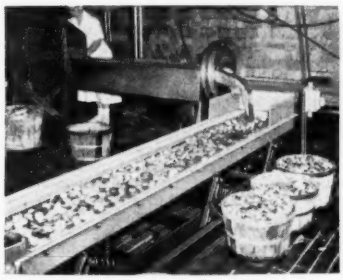
'Canned' Pump Won't Leak

Here's a new compact "canned" pump—the Model 670E, described as an economical leak-proof unit for handling up to 1,500 gpm. with heads to 20 ft.

It's termed "canned" because rotor, shaft, and impeller form single enclosed assembly without stuffing box or mechanical seal.

Model is suitable for pressures to 150 psi. and temperatures to 220F. Buyer may specify either 115 or 220v. operation.—*Dynapump Div., Fostoria Corp., P.O. Box 35-5, Huntingdon Valley, Pa.*

Circle 317 on Reader Service Card



Speedily Sorts Slices

Eliminating hand sorting, new food-slice separator can speed many food operations. First designed to clear pickle slices from ends and scraps, it's now grading a growing variety of fruit and vegetable cuts.

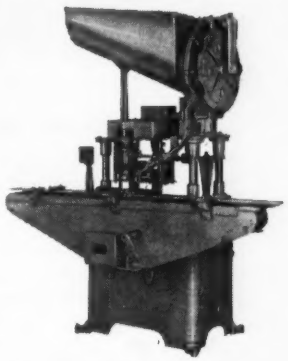
Unit works particularly well, says maker, with either Urschel Model "O" or "OV" slicers. As illustrated, sliced product goes onto screen deck, which moves at 30-40 fpm. Here, eccentric-drive vibration advances larger slices to discharge to production line, while under size and broken pieces fall through to disposal trough.—*Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill.* Circle 318 on Reader Service Card

for FREE demonstration or literature address:
WEST CHEMICAL PRODUCTS INC., 42-23 West St., Long Island City 1, N. Y.
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

CIRCLE 231 ON READER SERVICE CARD

RESINA

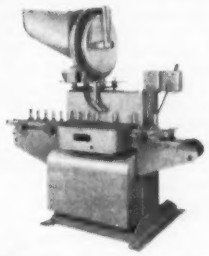
fully automatic
SCREW CAPPER



The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

TOPS THEM ALL

fully automatic
FITMENT APPLICATOR



Automatically selects plastic fitments (solid or perforated) with or without lift tabs and orients them into a chute. Passing container picks up fitment which is then snapped on the container. Speeds available up to 120 per minute or higher.

Descriptive literature and specifications on request.

RESINA AUTOMATIC MACHINERY COMPANY, INC.
572 SMITH STREET • BROOKLYN 31, NEW YORK

CIRCLE 127 ON READER SERVICE CARD

ACCURATE AUTOMATIC FEEDING

from ounces to tons per hour

ERIEZ HI-VI VIBRATORY FEEDERS

Only feeders with totally enclosed drive element as standard construction. A-C operated, electro-permanent magnetic drive

Continuous, uniform flow of feed of all sizes and shapes of bulk materials for blending, mixing, sorting, cooling, etc. Variable feed rate. Completely automatic, extremely accurate. Increases production, provides quality control, reduces maintenance and operating costs.

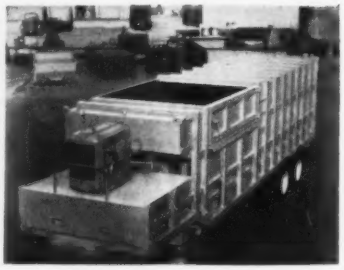
Fully enclosed drive element (standard—no extra cost) makes units dust and moisture resistant; ideal for sanitary applications. Break-resistant glass fiber springs • New patented magnetic drive provides greater feeding capacity than comparable size units • No rectifier needed • Simple installation • Factory pre-tested • Fully proved in plants everywhere

NOW AVAILABLE! . . . economical, specially constructed units for hazardous dusty locations . . . fully acceptable by Mill Mutual.

WRITE FOR FREE COMPREHENSIVE LITERATURE
Eriez Mfg. Co., 106-DB Magnet Drive, Erie, Pa.

ERIEZ

Equipment & Supplies



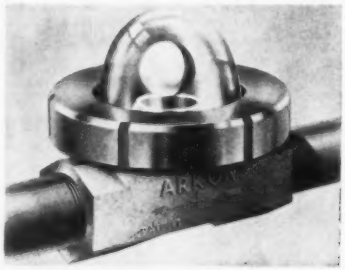
Compacting Waste Trailer

Food-plant wastes and general refuse are compacted to fraction of former volume in this hydraulic-press disposal trailer. Unit is specially designed for operators who generate large amounts of waste materials or have problem of long haul to disposal areas.

Two models are available, one packing 160 cu. yd. of refuse, other 210 cu. yd.

Hydraulic packing mechanism, controlled by lever, produces 65,000-lb. thrust. Head moves complete length of body, giving full discharge when dumping. An 18-gal. sump gathers liquids when wet matter is compacted.—*Dempster Bros., Knoxville, Tenn.*

Circle 319 on Reader Service Card



Dancing Ball Shows Flow

Simple Arkon "dancing ball" unit shows at a glance whether you have line flow. If you don't, ball drops out of sight.

Maker says flows down to 0.075 gpm. (water) and ½ cfm. (air or gas) are readily indicated by device, which is offered in ¼-in. pipe size for pressure to 100 psi.

Unit is suitable for use in air, steam, water, and oil-purge lines to instruments and mechanical seals, and cooling water lines to jacketed process vessels, compressors, and condensers. — *McIntosh Equip. Corp., Walker, Crossweller Div., 15 Park Row, New York City 38.*

Circle 320 on Reader Service Card

ERIEZ

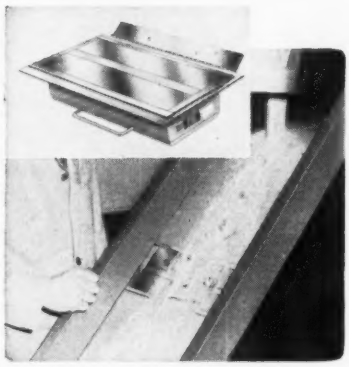
NEW SERIES 17

Erium-powered

PLATE MAGNETS

Greatest magnetic strength per dollar ever offered!

New Construction and Design ...New Magnetic Power



Protect your machinery and production. Safeguard your product quality and reputation. Eriez Series 17 Plate Magnets can pay for themselves many times over in many ways.

All welded steel and stainless steel construction is standard on these all-new plate magnets in every model. They're more compact and rugged than previously available models . . . and designed to assure ease of installation in chutes, spouts, ducts, feed tables, and housings; and for suspension over screens, moving conveyors, etc. Wide mounting flange for better, easier dust-tight installation. Uniform dimensions for greater interchangeability.

Tops for performance because of their Erium-powered* magnetic circuit providing intense concentration of power in the most essential areas (three strengths available).

**Erium—an exclusive, high quality permanent magnetic power source specifically designed and energized by Eriez.*

Here's the finest, most versatile plate separator performance at the lowest dollar cost. Write today for complete data on Series 17 Plate Magnets to:

Eriez Mfg. Co., 106-DA Magnet Drive, Erie, Pa.

ERIEZ

PRAGUE POWDER
ANTIOXIDANTS
BREADING MIXES
SOLUBLE SEASONINGS
PURIFIED GROUND SEASONINGS
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GRAVY BASES
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SOUP BASE SEASONINGS
PHOSPHATES
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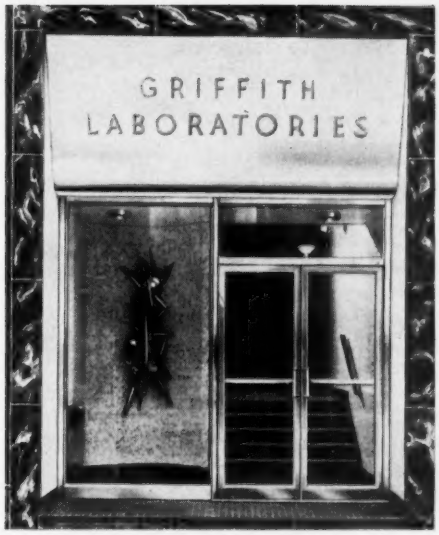
CASEINATE
PROTEINATE



Where Many find the Answer to—

"What's New in Foods?"

The Griffith organization is unique—in its diversification, its laboratory and kitchen facilities and skills.

It is known for its service as specialists . . . in the Art of creating fine foods formulas, and in the Science of faithfully repeating them.

If interested in a new food material, or in a new quality standard—you've come to the best qualified source.

THE GRIFFITH LABORATORIES, INC.

CHICAGO 9, 1415 W. 37th St. • UNION, N. J., 855 Rahway Ave. • LOS ANGELES 58, 4900 Gifford Ave.

CIRCLE 129 ON READER SERVICE CARD

This is only one proof of GAYLORD *quality*

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . . which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide organization of packaging talents, devoted to delivering the most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?

Gaylord Boxes
CORRUGATED SOLID FIBRE
GAYLORD CONTAINER DIVISION CROWN ZELLERBACH CORP.
CERTIFICATE OF BOX MAKER
THIS BOX CONFORMS TO ALL CONSTRUCTION REQUIREMENTS OF UNIFORM FREIGHT CLASSIFICATION
BURSTING TEST 200 LBS. PER SQ. INCH
SIZE LIMIT 75 INCHES
GROSS WT. LT. 65 LBS.
U. S. A.

Seal illustrated above used for shipping containers conforming to Uniform Freight Classification No. 41.

CROWN ZELLERBACH CORPORATION
GAYLORD CONTAINER DIVISION

IN CANADA · CROWN ZELLERBACH CANADA, LTD. VANCOUVER, B. C.

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

Easy-Clean Screening Unit

Economical automatic screening and sifting unit for granular and powder products is designed for long life and low maintenance.

Stainless steel parts are readily demounted for daily cleaning.

Amplitude and frequency vibrations may be altered to fit needs. Screener operates on eccentric-weight principle, and all wear parts, except screen, are replaceable stock items.

Buyer may choose model to fit individual requirements. — *Speedex Equipment Co., 57-11 Roosevelt Ave., Woodside 77, N. Y.*

Circle 321 on Reader Service Card

Jiffy Case Strapper

Fast air-powered strapper for casing and materials-handling work takes but 3 sec. to tension, tie, and cut round steel strand.

Listed as USS Model 13, compact unit weighs less than 20 lb.

After threading machine and draping package, operator merely turns single control to complete strapping task.—*United States Steel Corp., 120 Montgomery St., San Francisco.* Circle 322 on Reader Service Card

INGREDIENTS

New Autolyzed Brewer's Yeast Fraction, Amber Byf Series 50, is water soluble fermentation-medium component containing minimum of 10% total nitrogen, of which at least 40% is amino nitrogen. Called an excel-

NIAGARA "no frost"

BEST COLD-CONTROL and the LOWEST COST

● **You can have 20′ head room and hold below 0° storage space. Niagara's "NO-FROST" method gives you a constant, even safe temperature in every foot of height with plenty of head room to stack your goods and use your fork lift trucks efficiently. You don't have to let ineffective refrigeration force you into bad layout. Your storage, break-up and order assembly areas can be just as you want them. Insist that your new building design lets you handle frozen food as fast as dry groceries. You can get it with Niagara "NO-FROST" plus lowest upkeep expense in the business.**

Write for Bulletin No. 105

NIAGARA BLOWER COMPANY

Dept. FE-4, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities

CIRCLE 233 ON READER SERVICE CARD

add sales punch to your foods with **PRO-80** *protein*

The sales punching-est words in food merchandising these days are "protein enriched." With General Mills Pro-80 Vital Gluten (80% wheat protein m.f.b.) you can raise the protein content of your foods to any level desired. Economically. Easily. Pro-80 provides these processing benefits:

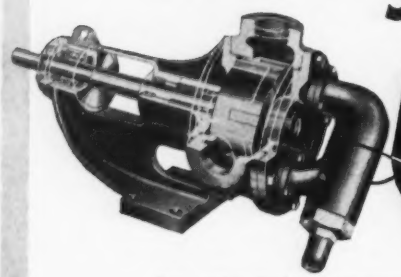
★ *Hydration agent* ★ *Oil and fat absorber*
★ *Adhesive and cohesive agent*
★ *Dough former* ★ *Strengthening agent*

You should get all the facts about Pro-80 right now while interest in protein enrichment is still climbing. For more specific information covering your food product write:

SPECIAL COMMODITIES DIVISION
Minneapolis 26, Minn.

General Mills

FASTER SPEED



NOW SAVES ON
VIKING
Stainless Steel and other Alloy Pumps

Now Viking Positive Displacement, Heavy-Duty type pumps, made of stainless steel, monel, mild steel and other alloys, can be operated up to 100% rated speed on thin liquids.

By increasing the capacity and speed of a pump, upwards of $300 to $400 can be saved on some sizes.

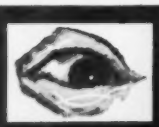
Entirely new, modern foundry facilities and manufacturing processes enable the complete line of Viking alloy Pumps to meet still more exacting requirements.

If your specifications call for alloy pumps, see how you, too, can save on our new line of full speed Viking alloy Pumps.

For information, send today for catalog series ME

VIKING PUMP COMPANY
Cedar Falls, Iowa, U. S. A. In Canada, it's "ROTO-KING" pumps
See Our Catalog in Sweet's Plant Engineer's File

CIRCLE 234 ON READER SERVICE CARD



SEE a demonstration by a specialist

SIMPLIFIED
"DRY FOG" INSECT CONTROL
PROGRAM

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lent stimulator of microbial growth, product is a dry powder, easy to handle and weigh.—*Amber Laboratories, Inc., 3456 N. Buffum St., Milwaukee 12.* (323)

NEW SUPPLIES

Plant-Roof Coatings that last longer are reported attained with Revco Liquid Aluminum. Supplier says this bright surfacing turns back 71% of sun's heat, reducing below-roof temperatures as much as 20F.—*Revere Chemical Corp., University Center Station, Cleveland 6.* (324)

Flexible Hose for Carrying Live Steam, tradenamed "White Line," incorporates extruded Teflon (TFE) innercore, bronze wire reinforcing braid, and swaged fittings for superior life and resistance. Sizes range ¼ to 1 in.—*Titeflex Inc., Hendee St., Springfield 4, Mass.* (325)

New Dry Lubricant, called Perma-Slik, is recommended for use on bakery equipment. A compound of graphitized-molybdenum disulphide, it provides permanent slick coating to any type wearing surface. Comes in handy aerosol.—*Everlube Corp., 6940 Farmdale Ave., North Hollywood, Calif.* (326)

BRIEFS

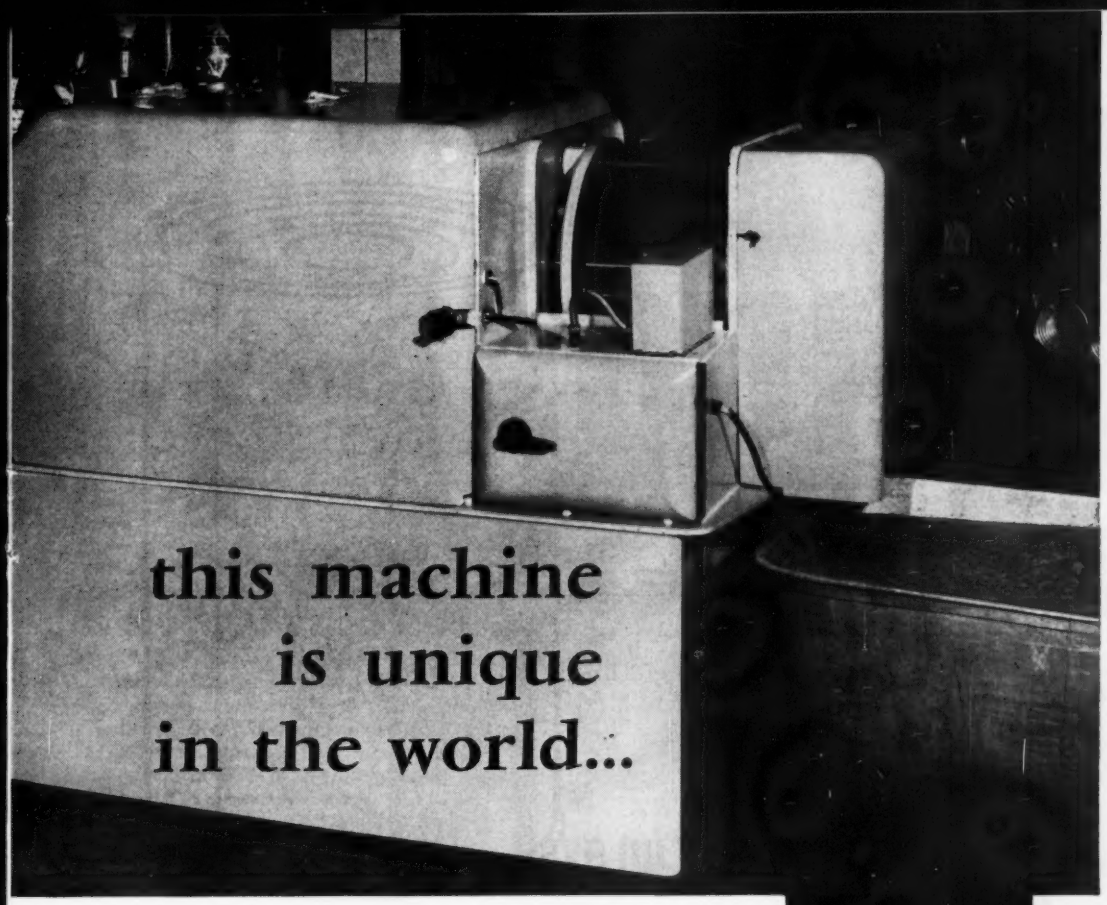
Time-to-Minute and Coding Are Printed on Strip Charts by handy automatic kit-form printer called Identichart RI-5. Saves need for someone to watch and mark charts for sequence-condition checks. —*Royson Eng. Co., Hatboro, Pa.* (327)

Tank-Truck Washing Equipment, tradenamed Jet-Stream, features new nonclog, solid-cone nozzle that disperses up to 80 gpm. of cleaning solution to cover all interior-tank surfaces. Unit readily attaches to any standard manhole.—*Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3.* (328)

Cabineted Chlorinators of new 3400 Series accent accuracy, flexibility, safety. Controlomatic models of line precisely feed on signal according to proportional, start-stop, program, multiple rate, or residual-control requirements.—*Fischer & Porter Co., 467 Jacksonville Rd., Warminster, Pa.* (329)

CIRCLE 132 ON READER SERVICE CARD

CIRCLE 133 ON READER SERVICE CARD→



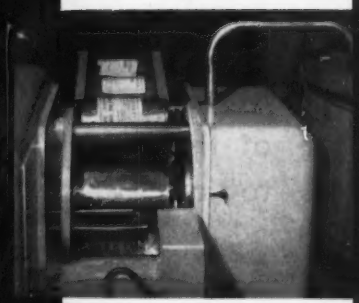
this machine is unique in the world...

You can see it, like thousands of visitors to Maisons Alfort, in the part of the factory reserved by "Alsacienne Biscuits" to the making of the Chamonix-Orange. Entirely designed and realized by the Alsacienne Biscuits, unrivalled in the world, this machine, the BOXTRUDER "swallows" 180 tins of preserved oranges an hour. In 20 seconds, an 11 lbs. tin is opened, emptied, flattened out, ready to be baled, while the contents are sifted, mixed, homogenized and emptied at 99.5 %.

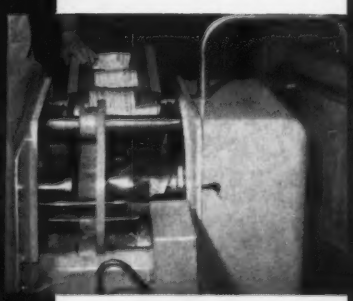
...But it can soon be in your factory.

Do you think, as a manufacturer, that BOXTRUDER (Patent Nº 788.282) answers your needs for productive capacity and rentability ? The Management of the Alsacienne Biscuits will be pleased to show it to you and to supply it. **(5 rue Victor Hugo - Maisons Alfort Seine - France. Tel. ENT 49-02).**

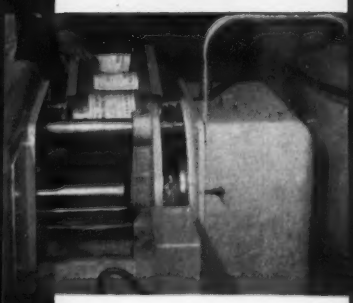
Completely flattened, the tin is automatically thrown out. The operation has taken 20 seconds, without any manual operation, therefore without any risk of injury.



The BOXTRUDER is fed by an inclined plane, bringing each tin into position.

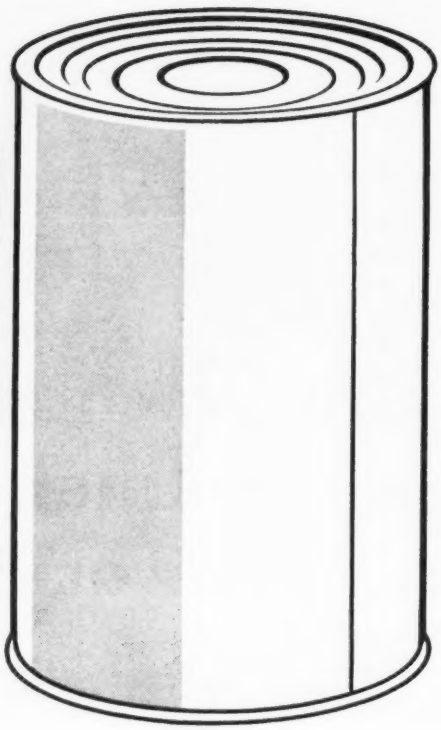


Each tin then undergoes a horizontal pressure of 15 tonnes, that pierces it and squashes it while emptying it.



Entirely emptied, the box is squashed flat ready for baling ; while the total contents leave through an emptying spout, perfectly sifted, mixed, homogenized.

150 YEARS YOUNG



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Portable Welder for CIP-Line Fittings and Valves is inert gas shielded arc unit capable of simple, fast on-job fabrication of complete assemblies. Tripod-mounted, it handles intricate bench work. Detached, it can be placed directly on line for welding long pipe sections.—*Ladish Co., Tri-Clover Div., Kenosha, Wis.* (330)

New Case Stacker for Dairies, designated Model E, is economy unit that stacks up to 7 cases high with capacities to 15 cpm. It mounts directly over in-floor conveyors in less than 20 sq. ft. space. Maker cites low-cost installation and maintenance.—*Cherry-Burrell Corp., Cedar Rapids, Iowa.* (331)

Compact Cutting Unit, the Presto Automat made in West Germany, combines actions of grinding, mixing, milling, and mincing various food materials, including frozens. It incorporates series of counter-rotating blades. Pushbuttons control blade and bowl speeds. Distributor—*Barliant & Co., 222 W. Adams St., Chicago 6.* (332)

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CIRCLE 135 ON READER SERVICE CARD

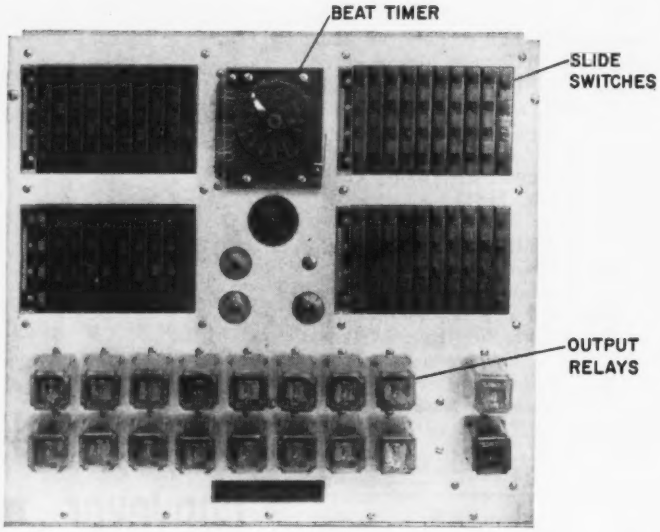
New from Taylor for CIP Systems

VALVE PULSING CONTROL PANEL

Insures effective cleaning of CIP Product Handling Valves and associated piping and processing equipment programming the cycling of the CIP Valves. Actuated by the timer on the CIP recirculation system, one Control Panel can program up to four completely independent circuits.

The Valve Pulsing Control Panel is simple, dependable, and highly adaptable. Programs can be varied without wiring changes. Step switch and relays plug in. Relays contain indicator lights. A jog switch permits simple checking of relays, external solenoid valves and CIP valves.

The panel is expandable—relays, 2 or 3 pole, can be added as plant needs change. All units include 16 relay sockets and wiring. It can be mounted in rear of a control panel, or in dust-tight control box.



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Sucrodex is just one of the new Flo-Sweet sugars developed to help you cash in on the swing to new food products. For full information, consult your Flo-Sweet Engineer or write for the brochure "New Ingredients for New and Improved Food Products." It tells all about four new Flo-Sweet liquid sugars!

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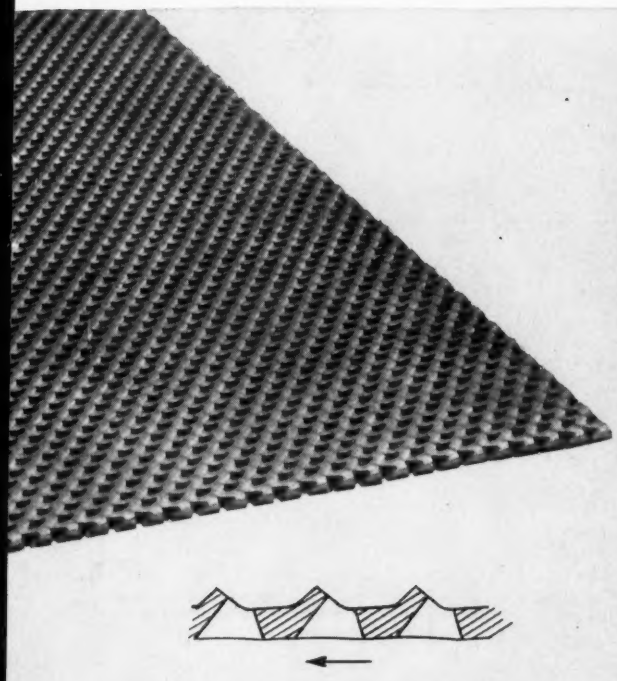

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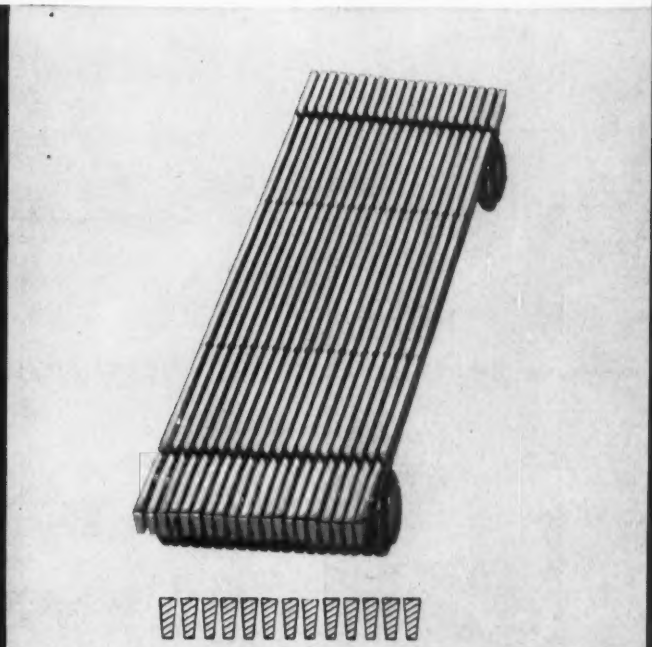

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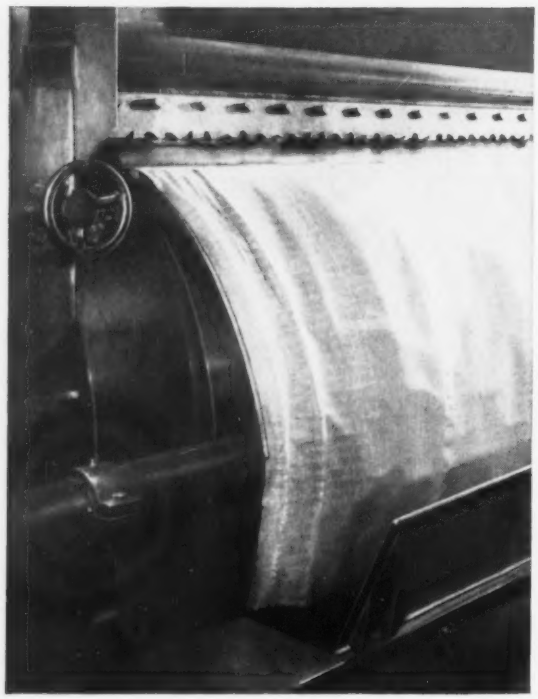

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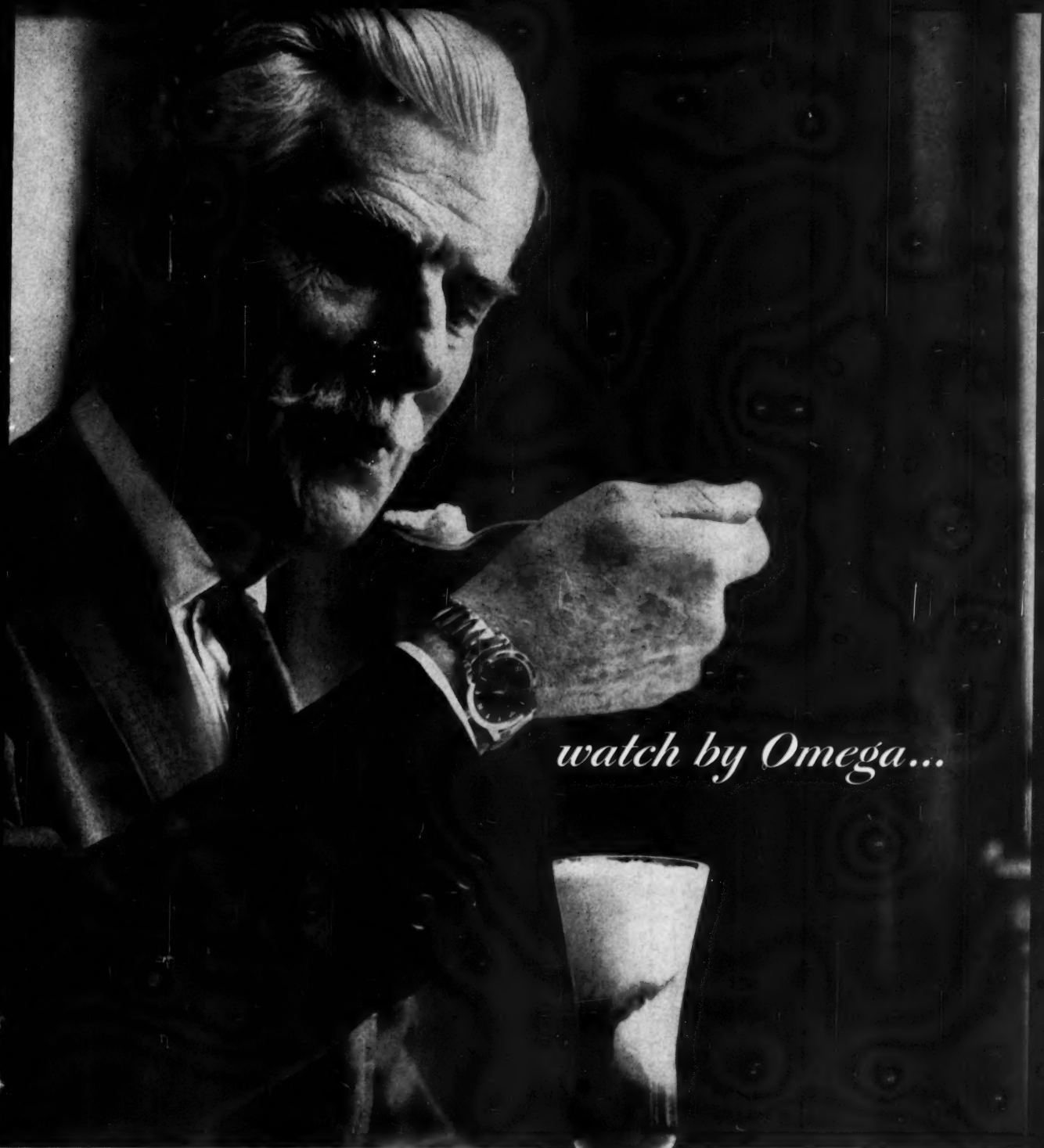

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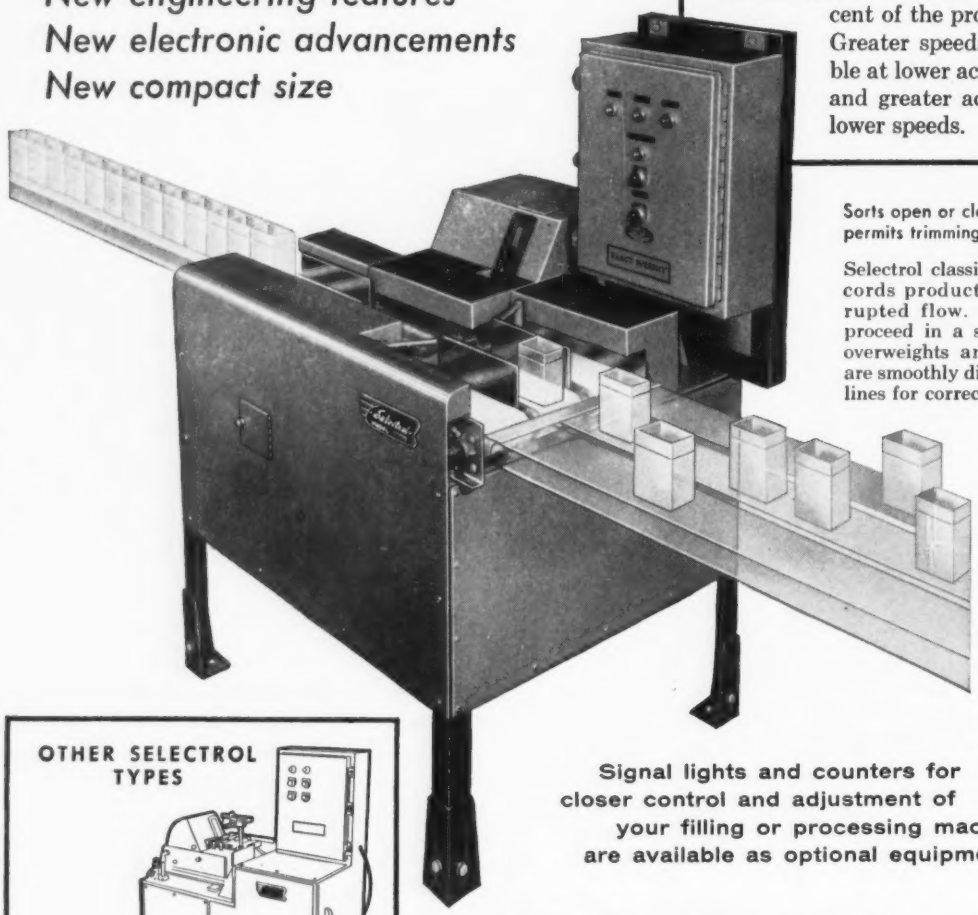

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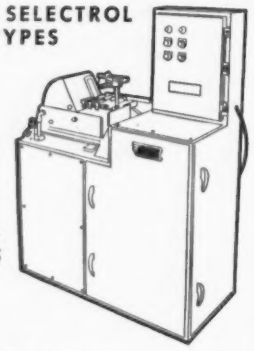
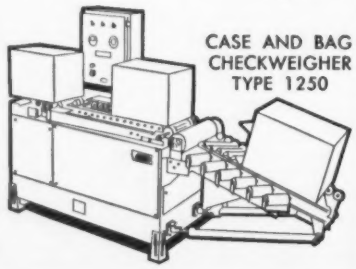


TYPE 1245



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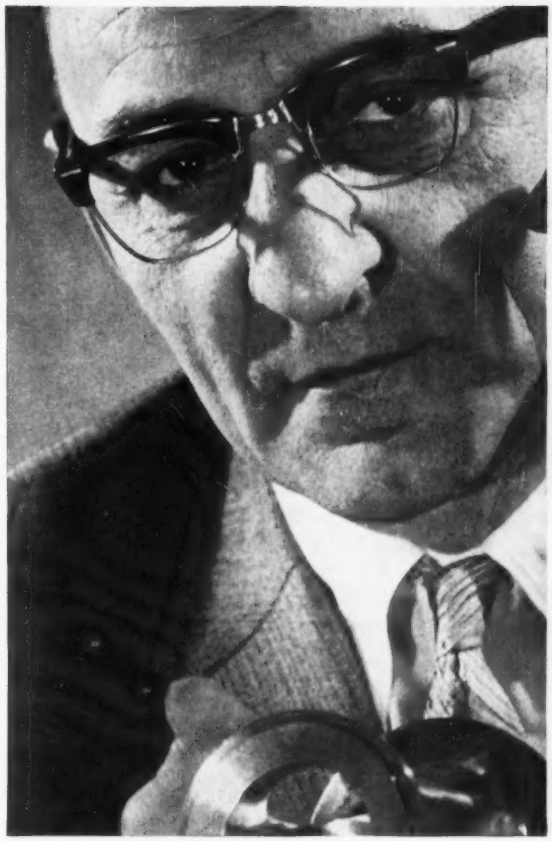

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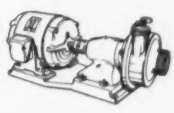

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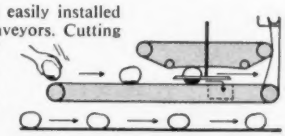

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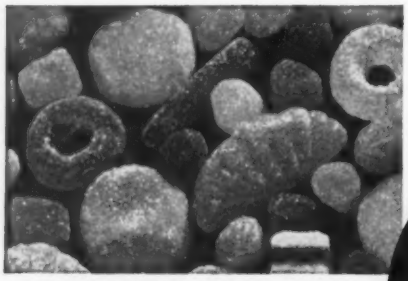

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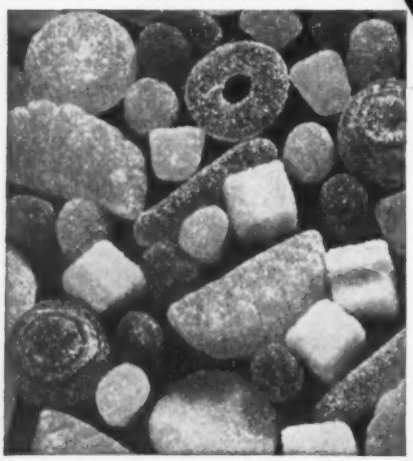

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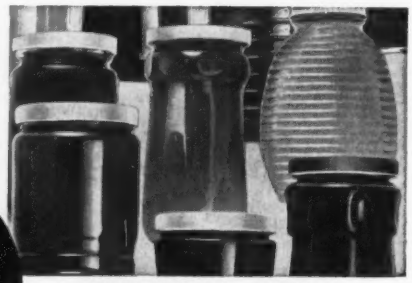

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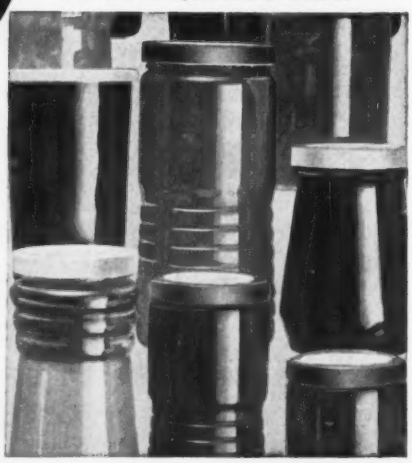

CIRCLE 144 ON READER SERVICE CARD

CIRCLE 145 ON READER SERVICE CARD→

RYKON *Grease*

passed this test at Corn Products Company

Situation: The springs in the grease chargers on expeller machines at Corn Products Company's Argo, Illinois, plant are under extra heavy tension. Due to this tension, oil formerly separated from the grease thickener in the grease cups. Bearings did not receive proper lubrication and the cups filled with grease thickener residue. The system needed cleaning every three months. Each time, large amounts of residue were found. Ten special-purpose greases were tried in an effort to solve the problem.

What was done: A Standard Oil lubrication specialist working with Corn Products' plant maintenance people recommended RYKON Grease #2 E.P. The system now needs cleaning only every six to nine months. Very little residue is found. Now RYKON Grease has become one of the important lubricating greases in use at Corn Products' Argo plant.

RYKON Grease is formulated with a unique non-soap organic thickener. The fibers of this thickener hold RYKON's fine quality base oil firmly in suspension. The grease resists water washing, high temperature and dirt contamination while providing superior lubrication to bearings of all types.

What you can do: Get more facts about RYKON Grease from the Standard Oil office nearest you anywhere in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

You expect more from **STANDARD** *and you get it!*

Standard's Arnold Parus and chief lubrication foreman Henry Anderson take a look at expeller unit's grease system. Arnold Parus is well equipped through experience and training to work with plant men on lubrication problems. Arnold has a B.S. degree from Bradley University and three years' field experience in this kind of work. He has also completed Standard's Sales Engineering School.

Quick facts about **RYKON** *Grease*

- Heat stable. At sustained high temperatures, RYKON Grease remains soft and grease-like.
- Resistant to water washing.
- Mechanically stable. Minimum change in consistency in service.
- Resistant to oxidation. Thickener acts as inhibitor.
- Exceptional rust preventive properties.

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Major sections of the book include: marketing policy, planning, and strategy; advertising; retailing; public utilities; influence of government; research; and education.

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Extremely comprehensive studies of these areas are reported by noted chemists in the carbohydrate field and related areas.

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PHYSICO-CHEMICAL PROPERTIES OF WHEAT PROTEINS. *Society of Chemical Industry, London. MacMillan Co., 60 Fifth Ave., N.Y.C. 1959. 92p. Price:* $2. Comprises the papers read at the Food Group Symposium of the SCI held in London, March, 1957.

INVENTORIES & BUSINESS HEALTH, *by Roy A. Foulke. Business Publications Div., Dun & Bradstreet, Inc., P. O. Box 803, Church St. Station, N.Y. 8, N.Y. 1960. Price:* $1. Discusses causes of inventory losses and offers guides to control.

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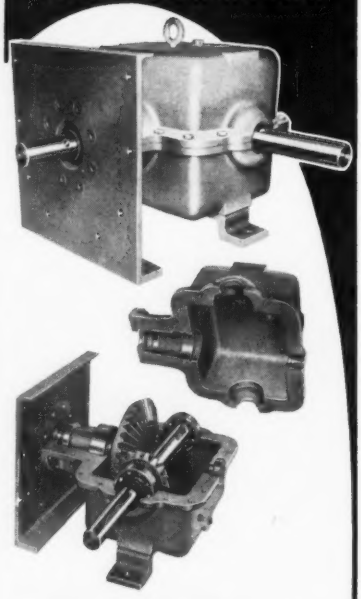

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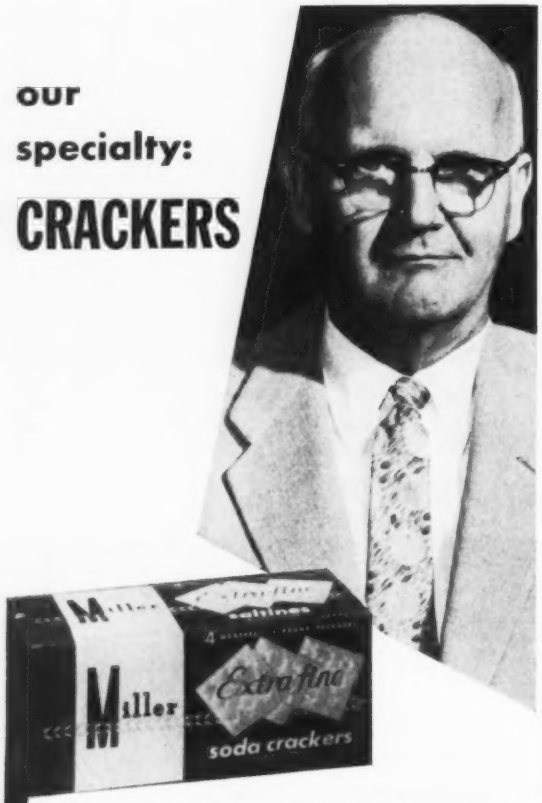

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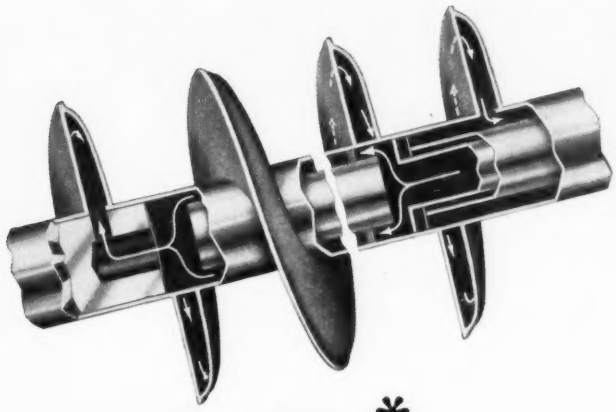
New savings in heat-exchange processes . . .

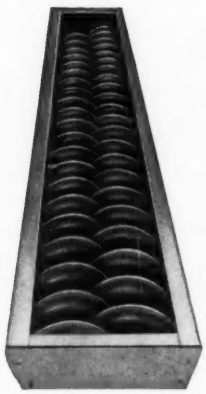


THE holo-flite* PROCESSOR
(HOLLOW-FLITE)

A simpler, more compact way to cool, heat or dry—in continuous flow!

Do you have processes where slurries, solids, pulps or pastes must be cooled, heated or dried? Do you know you can now handle such processes—*in continuous flow*—in as little as 1/5th the space required by other types of heat exchangers—and with many other important advantages?

The revolutionary HOLO-FLITE Processor is the answer!



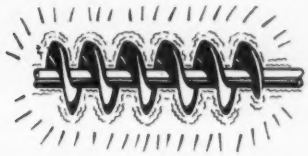
what IT IS!

Basically the HOLO-FLITE consists of two or more flights of hollow-bladed screw conveyors. The product to be processed moves in a trough around the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums—*as the product is continuously moved along in a bulk-flow without interruptions!*

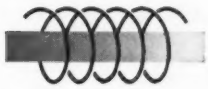
Our engineers will gladly study *your particular* operations and make recommendations. Write, wire or phone our nearest office!

why IT'S BETTER!

The HOLO-FLITE principle provides many important advantages in modern processing operations . . .



ITS LARGE HEAT-TRANSFER SURFACE requires far less space—as little as 1/5th the space required by other heat-exchange equipment. Further, flights can be "stacked" as high as desired to save floor space, simplify installation!



ITS SLOW ROTATION IS SO GENTLE that granular and powdered solids are handled with no dusting—little or no particle abrasion. Result—no dust recovery problems . . . simple, inexpensive installation.

IT IS ADAPTABLE to a wide range of applications—handles solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, water or other fluids to provide a wide range of temperatures. Cooled products can be packed directly from HOLO-FLITE discharge, saving time, space and additional handling.

IT CAN BE DESIGNED to handle virtually any capacity by varying the diameter and length of the flights, and the number of "tiers."

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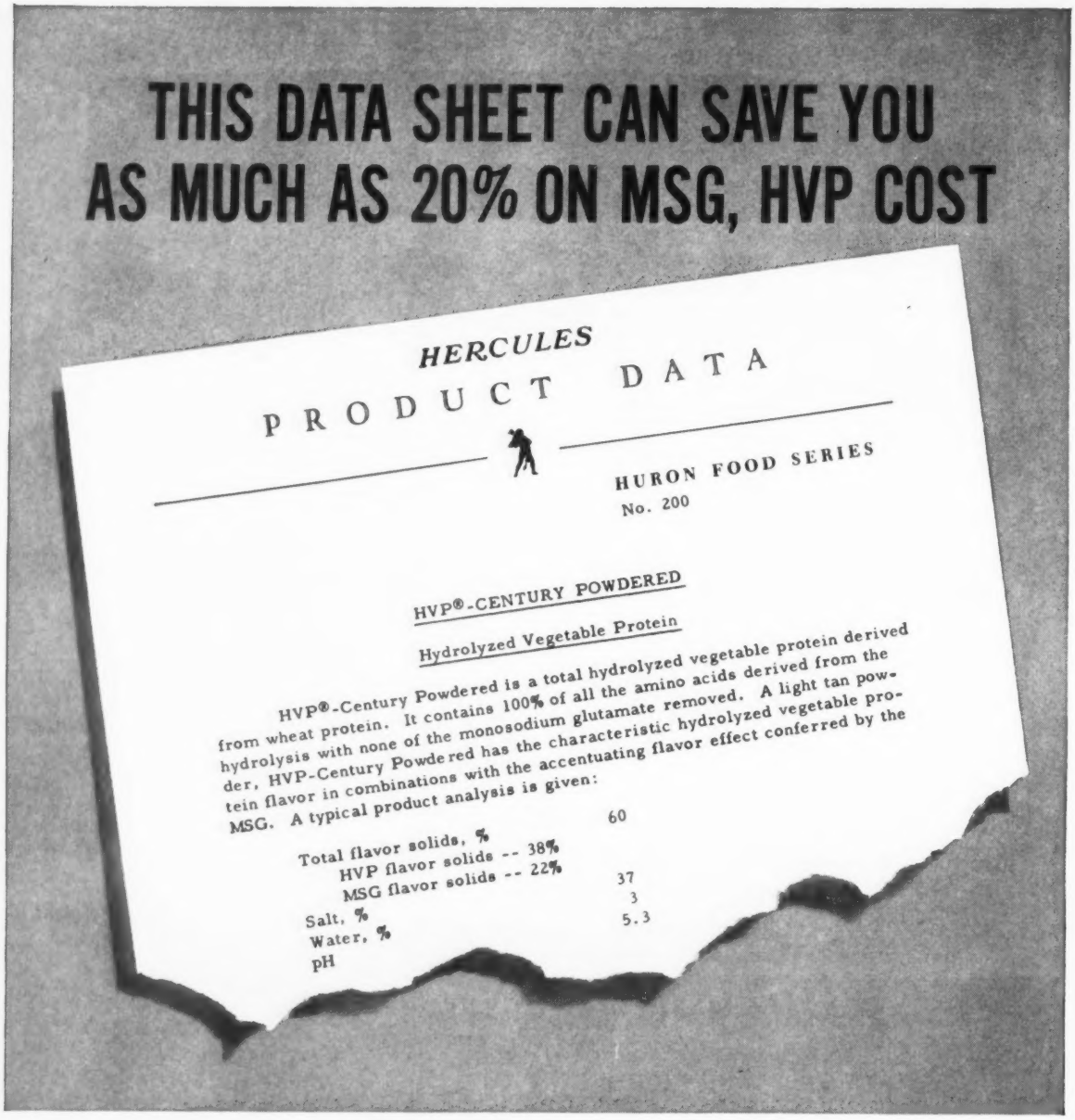
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HVP®-CENTURY POWDERED
Hydrolyzed Vegetable Protein
HVP®-Century Powdered is a total hydrolyzed vegetable protein derived from wheat protein. It contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed. A light tan powder, HVP-Century Powdered has the characteristic hydrolyzed vegetable protein flavor in combinations with the accentuating flavor effect conferred by the MSG. A typical product analysis is given:
Total flavor solids, % 60
HVP flavor solids -- 38%
MSG flavor solids -- 22%
Salt, % 37
Water, % 3
pH 5.3

Now—besides its full line of HVP powder and liquids as well as MSG—Hercules offers HVP®-Century powdered, a total hydrolyzed vegetable protein derived from wheat protein. Containing 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed, this new product offers the possibility of cost savings and processing advantages wherever the flavor of well-browned beef is desired.

This new four-page data sheet provides complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. We'll be glad to send you a copy along with a sample of HVP-Century. For information, write to

Huron Milling Division, Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
900 Market Street, Wilmington 99, Delaware

VH60-2

Recent Inventions

penser for Granular Products.—C. E. Foreman, Lincoln Park, Mich. No. 2,910,213.

Food Package Comprising Two Layers of Thermoplastic Material That Shrink When Subjected To Elevated Temperatures.—H. Rumsey, Jr., Rochester, N. Y. No. 2,911,305.

Packaged Honey Consisting of Chunk Comb Immersed in Liquid Honey and Coating With Pectinate Film.—J. W. White, Jr., USDA. No. 2,902,370.

Cartoner Comprising Pocket-Type Conveyor, Product Chutes Spaced for Pusher to Insert Product Into Cartons.—C. L. Barr, F. B. Redington Co., Bellwood, Ill. No. 2,909,874.

Screw-Threaded Closure Caps Applied to Product-Filled Containers With Threaded Necks.—J. Hohl, Owens-Illinois Glass Co., Toledo, O. No. 2,909,879.

Closing and Locking Cartons With Hinged Covers on High-Speed Unit.—H. J. Mumma, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,909,880.

Coating Foods Maintained at Low Temperature With Molten Ethyl Cellulose.—L. E. Patten, Dow Chemical Co., Midland, Mich. No. 2, 909,434.

Cracker-Sandwich Making Machine.—F. E. Fowler, Athens, Ga. No. 2,902,948.

EQUIPMENT

Egg Breaker and Shell Expresser.—F. L. Kauffman, Swift & Co., Chicago. No. 2,898,961.

Apparatus for Loading Bread Into and Unloading It From

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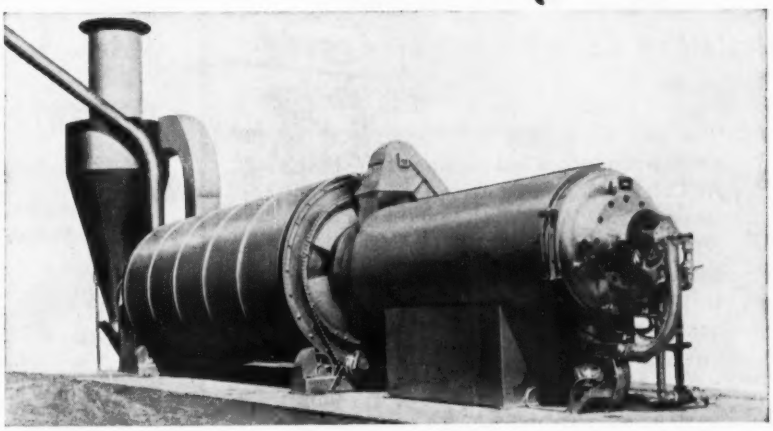

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Take a good hard look at the economics of your drying operations, especially if you're operating many small units.

Consider this: a 15,000-lb-per-hour Heil dryer, feeder and grinder costs about 30 percent less than two 6,000 or 7,500-lb-per-hour units. You save on initial investment and still get the same production capacity.

But you save other ways, too. A single larger Heil dryer requires less floor space and horsepower to operate. You can estimate as much as a 10 percent saving in over-all operating costs.

Make sense? Of course it does. Your Heil representative will be glad to look over your drying operations and help you take advantage of cost-cutting improvements a Heil dryer offers. Call him soon.

THE HEIL CO.
3000 West Montana Street
Milwaukee 1, Wisconsin

MANUFACTURERS OF THE ARNOLD DRYER

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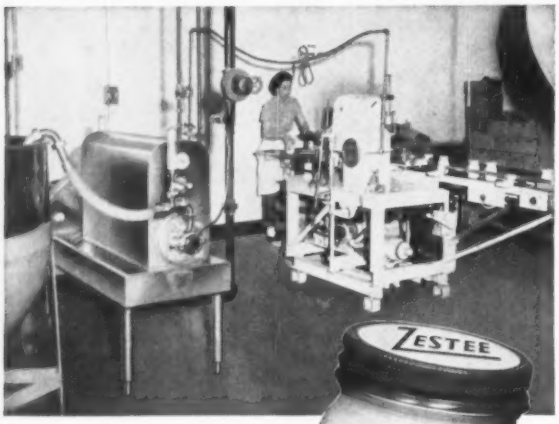
ANOTHER FOOD PROCESSOR PROTECTS QUALITY AND PROFITS WITH *Creamery Package®* EQUIPMENT



Direct-expansion refrigerant in a compact, mechanically agitated-film, tubular CP Swept Surface Heat Exchanger, shown adjacent to kettle, rapidly cools the starch base for Zestee Salad Dressing. This one cylinder heat exchanger has been specially engineered by CP to meet this fast cooling need. Other units, with one to four cylinders per base, are available for cooling with chilled water, glycol or brine. CP Swept Surface units are available for heating with water or steam.

Swept Surface®
HEAT EXCHANGER
Meets Fast Cooling Needs of ZESTEE
SALAD DRESSING

The key to a high bottling rate of a viscous product is fast cooling of the base. At Colonial Manufacturing Co., Inc., Oklahoma City, Oklahoma, this CP Swept Surface Heat Exchanger cools the starch base of Zestee Salad Dressing from 160° to 100° F. at the rate of 2000 pounds an hour, maintaining quality and meeting production requirements on time.

CP Sales Engineers, upon request, will be glad to analyze the possible advantages of CP Equipment in your process.

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Recent Inventions

Oven.—E. O. Engels, Baker Perkins, Saginaw, Mich. No. 2,900,927.

Fruit-Feeding, End-Trimming, Halving and Knock-Off Mechanism.—B. C. Coons, San Jose, Calif. No. 2,901,014.

Machine for De-Lidding and De-Panning Bread.—F. Stadelman, Latendorf Conveying Corp., Bayonne, N.J. No. 2,901,135.

Liquid-Level Control System Employing Thermocouples. G. H. Bancroft, Consolidated Electrodynamics Corp., Pasadena, Calif. No. 2,898,933.

Mechanism for Separating Egg Whites From Yolks.—C. H. Willsey, Topeka, Kan. No. 2,900,071.

Continuous Sterilizer Comprising Means for Pressure Mixing Foods With Sterilizing Fluid.—V. R. Abrams, W. E. & John Barnes Co., Rockford, Ill. No. 2,909,985.

Rotary Catching System for Photoelectric Sorting of Lemons.—L. A. Kaufman, Mandrel Industries, Inc., Grand Rapids, Mich. No. 2,908,388.

Track-Suspended Permeable Trough-Shaped Containers Oscillated to Drain Cheese Curd.—C. Berge, Prehac, France. No. 2,908,973.

Coil-Type Refrigeration System to Freeze Fish in Boats.—M. L. Newell, San Pedro, Calif. No. 2,909,040.

Fruit Feeding and Orienting Unit.—J. M. Hait, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,909,270.

Egg Weigher Equipped With Elevating Platform, Switching Device, Data Storage Units.—H. J. Mumma, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,910,288.

Continuous Freezer for Packaged Foods.—V. C. Patterson, Philadelphia. No. 2,910,837.

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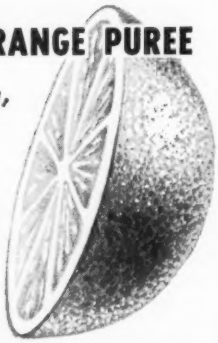

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Is Packaging Machinery Economical Enough?

Economy is a favorite subject of equipment buyers who are looking for ways to cut their costs. As a result, everybody talks economy because everybody wants economy. But how "economical" is economy supposed to be?

Obviously, your product has to look good to the consumer. Yet it must go into the package fast and with the least cost. The more time, labor and money it takes, the less you have left for profit.

With costs and competition going the way they are, economy has got to be a lot more "economical" than it used to be. Not only for products you're already packaging automatically, but for those you haven't even considered. Because automatic *packaging saves you money and improves your competitive position. That is, if it's economical* enough.

HOW *ECONOMICAL* DO YOU THINK PACKAGING MACHINERY SHOULD BE?

Take the example of a machine that automatically forms, fills, and seals bags—it can package anything from hardware to peas and beans. Your product may be entirely different, but look how much economy you must get from the packaging machine itself.

The machine should be simple in all ways. Without unnecessary complexity, it can do its work better and with less cost. And that savings in time, labor and care add to your profit.

You can really save
with the Triangle Bag Former, Filler and Sealer
—basic single-tube design . . . no involved adjustments . . . needs less operating attention and maintenance than normally expected.

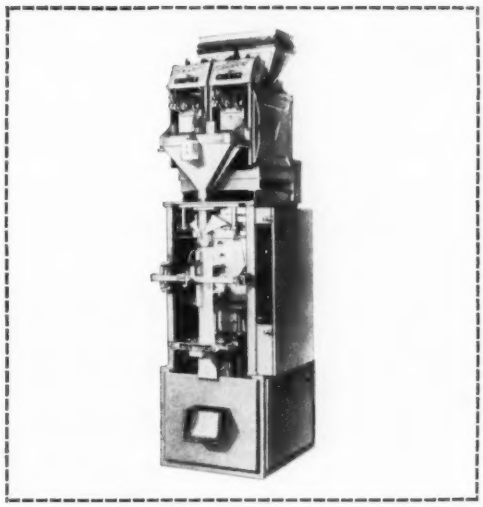
The machine should be fast. Because greater output per minute costs less per unit. And that lower cost gives you competitive advantage *and* more profit.

You can really save
with the Triangle Bag Former, Filler and Sealer
—55 bags per minute output—consistently . . . equal to complex twin-tube designs in many cases.

The machine should be versatile. Your line already includes more than one product in more than one package size. And, there are even more in the future. Bagging materials will change as well. But a new machine for each is not economical. Nor is costly downtime for machine change-over.

You can really save
with the Triangle Bag Former, Filler and Sealer
—handles all heat sealable materials . . . fast, simple change-over without delicate or involved adjustment.

How *more* economical could packaging machinery be? Simplicity of design, speed of operation and versatility for present and future needs—*these* are the efficiencies that the truly economical machine must have.



Regardless of what kind of product you're packaging, see Triangle when you are considering packaging equipment. We don't make equipment for *every* packaging need, but why take the chance of overlooking the real advantage our equipment offers you.

Write and describe your packaging needs. Let us send our full color 3-D slides and viewer of the equipment that will do your job (post paid both ways). No obligation, of course.

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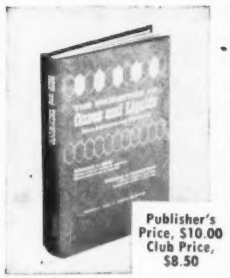

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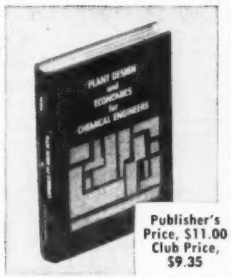

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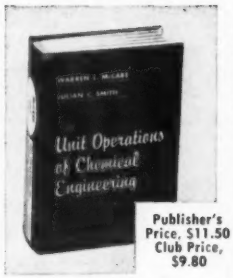

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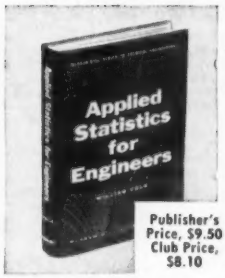

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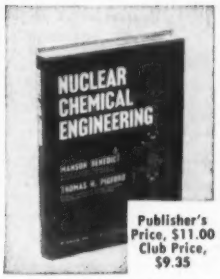

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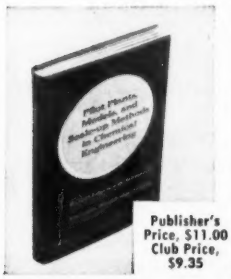

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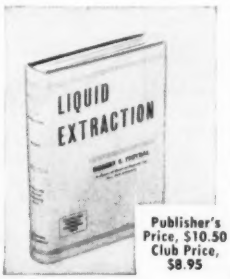

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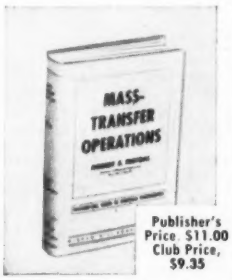

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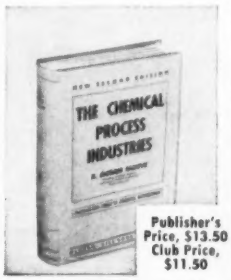

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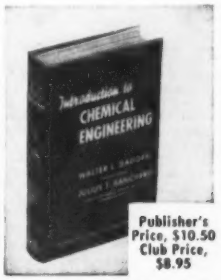

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Evaporator Sales Engineer. We have a position open on our staff for a qualified sales engineer to specialize in the sale of evaporation equipment to the food processing industry. This position requires a man acquainted with the food processing industry and who has a good knowledge of evaporation equipment and processes. All replies will be kept on strict confidence. Reply in writing to personnel director, A.P.V. Company, Inc., 137 Arthur St., Buffalo 7, N. Y.

Man for setting up system for production, inventory, butter fat and product pounds control; must have detailed knowledge of milk and ice cream business; state age, experience, education, marital status, organization membership, references and salary expected. P-4128, Food Engineering.

Bakery Specialty Product Manufacturer wants Food Technologist or Chemist with sales personality to specialize in product development work. At least three years' experience required, preferably in line specializing in jams, jellies, flour mixes. Must be willing to travel 25% of time contacting trade on custom-made product development work. Balance of time spent in laboratory creating and improving products. Salary open. Please send resume to: P-4010, Food Engineering.

Technologist for development work and quality control at least 2-4 years experience, preferably with salad dressings. Require young man capable of independent thought with desire to grow along with new and dynamic division of established concern in Metropolitan New York area. P-3907, Food Engineering.

Glazed Fruit Expert—Israel Manufacturer desires service of expert experienced in all phases of glazed fruit production. Position requires residing in Israel temporarily. Contact: Office of Israel Trade Commissioner, 250 W 57 Sts., N.Y.C. 19, Ph. CIrcle 5-1215.

• POSITIONS WANTED

Food Technologist, with extensive experience in manufacture, development, control, of a wide line of confectionery and chocolate products, desserts, cereal products, ice cream, and other food products, as well as laboratory direction, desires position of responsibility. PW-3972, Food Engineering.

POSITIONS WANTED

Dairy Technologist: 36 years old. M.S. Dairy Technology, experienced in quality control, production and sales of milk, ice cream, butter, cottage cheese and pressurized cream; also quality control in paper food container industry. PW-3930, Food Engineering.

Food Technologist—B.S.—with extensive and responsible experience in quality control, production control, & technical service of salad dressing, margarine, dairy products, bread making, and food sanitation. Desires challenging position preferably in technical service, product development, or quality control. Metropolitan NYC area, of Northern New Jersey. PW-4034, Food Engineering.

Food Technologist—14 years extensive and responsible experience in quality control, procurement, research, and production in dairy field with excellent contacts in dairy industry. PW-4100, Food Engineering.

Food Process Engineer—Food Technologist seeks new challenge. Chem. Eng. and Food Tech. degrees. Eight years broad experience teaching, consulting and industrial work. Strong in engineering, advanced processing techniques, cost analysis and cost reduction, technical development and management. Would consider small company if it has good growth potential. PW-4109, Food Engineering.

Automation Engineers (2) Electro-Mechanical experience (Over 10 years each) in design and development of special purpose automatic machines and electronic controls for automatic production, inspection, testing, sorting and control of machines by punched tapes. Interested in challenging assignment in New York City. PW-4110, Food Engineering.

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Automatic Control Circuits Designed to fit your requirements. PTW-4174, Food Engineering.

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1—**17,650** gal. horiz. T316 ss tank, 9' x 36', int. coil.

1—**Niagara** #510-28, 510 sq. ft. T316 ss

2—**Oliver** 5'3" x 3' rot. vacuum filters T316 ss, ASME 25#. Precoat.

1—**Alco** 110 sq. ft. T316 ss press. filter.

6—**Stainless** Vacuum Tanks: 3500, 3000, 2800, 2000, 1750, 1000 gal. with coils.

2—**Sharples** Super-D-Canters, T316 ss.

2—**Bird** centrifugals, 18" x 28", 32" x 50".

6—**Buflovak** double drum dryers; 42" x 120", 42" x 90", 32" x 72", 32" x 52".

3—**Louisville** rotary steam-tube dryers; 6' x 50', 6' x 25', 4' x 30'.

2—**Davenport** #1A dewatering presses.

4—**Sharples**, Super-D-Hydrators, C-20, C-27, T316 ss. or Monel.

6—**A.T.&M.** 40" susp. cent., T304 ss.

5—**2600** gal. T316 ss tanks, int. coils, 5 HP paddle agit.

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¼" pipe thread both ends
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1—EVAPORATOR, Arthur Harris. Single Effect S.S. T304 sanitary having 696 sq. ft. Complete.
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Worthington Air Compressor 3 H. P.
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Fillers for Milk Bottles & Containers
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Langsenkamp Colossal Finisher
Sterling, Blakeslee Peelers
Urschel Model 6 Dicer
Anderson Model 4 Dicer
FMC #50 S/S Juice Extractor
FMC Cont. Abrasive Peeler

M & S 6 pocket Filler #10 Cans
M & S S/S 10 Pocket Piston Filler
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U. S. Sanitair DS8 Bottle Cleaner
CRCO Model NWS Jar Cleaner
Capem C-4-F 120 BPM Capper
Capem B-2-F 120 BPM Capper
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U. S. Bottlers RC8 Screw Capper
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Pneumatic Scale Duplex Labelers
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Atomizer: Mikro type 5MA, st. steel.
Cappers: Resina, Pneumatic Scale Swanson, Capem.
Centrifugal: Tolhurst 20" type 316 st. st.
Crystallizers: 550 gal. st. st. jktd. agit.
Deodorizer: Rogers stain. steel.
Disintegrators: Rietz RD 18-P, steel, 75 hp.
Dryers: Devine 2 x 4 vac. drum st. steel.
Dryer: Stokes Vacuum 2-shelf model 51.
Evaporator: Buflovak st. st. 94 sq. ft.
Filler: Mojonnier #90, 14 head, st. st.
Fillers: liquid vacuum, siphon, gravity.
Fillers: Stokes, Colton, Elgin, Geyer, M&S.
Fillers: powder Speeder, Triangle, Stokes & Smith.
Fillers: Stokes & Smith EG-1 for #10 cans.
Filter Press: Sperry Shriver 6"-36".
Filters: Int. pressure—Alsop, Sparkler, Lomax.
Gluer, carton: Stand Knapp, Ferguson, Triangle.
Homogenizers: 25, 60, 125 GPH.
Kettles: Stain Steel with or without agitators.
Kettles: 20 gal. Groen gas fired, st. steel. (New).
Labelers: Burt, Standard-Knapp, N. J. Pony Labelrites, Pneumatic Scale duplex.
Labeler: World auto, straightway.
Mills, hammer: Mikro, Gump, Prater, Raymond JayBee, Jeffrey, Williams, Fitzpatrick.
Enterprise vertical 15 hp.
Mixers, dough type: single and double arm.
Glen Power Plus 340 qt 5 hp.
Powder: 50 to 2000 lb. capacity.
23 cu. ft. double ribbon, st. st.
Mix-Muller: Porto 39" st. st. bowl.
Packager: Transwrap model B.
Vacuum Pan: Rogers 6' st. steel.
Vacuum Pan: Harris 42" st. steel.
Pasteurizers: Cherry Burrell 200 gal., to 1000 gal.
Percolators: Pfaudler 54" x 42" stain. steel.
Pumps: Centrifugal, rotary, gear vacuum.
Pulper: FMC MC-664, 30 hp.
Riving Mch: Fitzpatrick model 8 st. steel.
Screen: Rotex model 41 st. steel.
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Tanks: Stain, steel 25 gal. to 1200 gal.
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Send us your inquiries and list of idle equipment

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SPECIALS

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1—Harris 3 dia. 304 S.S. single effect Evaporator with coils
1—Wyssmont 304 S.C. Turbo Dryer 6'2 x 10'4" high, 24 shelves.
3—Buflovak Vacuum Shelf Dryers, 20—60" x 80" shelves.
1—Bird 18" x 28", 316 S.S. solid bowl, continuous Centrifuges.
1—Louisville 6' x 45' Rotary Steam Tube Dryer 304 S.S.
2—Struthers Wells 2000 gal. 316 S.S. jcktd. agtd. Reactors.
2—Buflovak 42" x 120" atmospheric double drum Dryers.
4—Sweetland Filters, #7, #10, #12.
1—Devine Vacuum Shelf Dryer, 10—40" x 43" shelves.
1—Abbe, 1,000 lb. aluminum Power Mixer, 7½ H.P. motor.
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PNEUMATIC SCALE CO. Synchronized Liquid Filling Line consisting of: Invert type Air Cleaner, 20 Spout Stainless Steel Filler, 4 Head Rotary Capper, Duplex Labeler.
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KARL KIEFER, 24 Spout Stainless Steel Rotary Vacuum Filler, synchronized to Karl Kiefer Bottoms-Up Rotary Bottle Cleaner.
BATTLE CREEK, Model #46, Wrapping Machine, equipped with Oliver Heat Seal Label Attachment.
TRANSWRAPS, Models A, B and C—with Electric Eye.
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Partial List—Send for complete list of equipment in stock

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2—Fitzpatrick comminuters, models D and K.
2—Kotex sifters 40" x 84", 40" x 120".
1—Ross 50 gallon pony mixer, SS.
2—Stokes rotary vac dryers 18" x 42", 2½' x 8'.

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AT Tremendous Savings

W. & P. 3000 gal. Jacketed Mixers.
Package Machinery Models FFH, FF, FA, FA-2, FA-3, FA-4 Wrappers. With and without Electric Eyes and Labeling Attachments.
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Hope 6 spout S/S Filler.

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Standard Knapp #429 Case Sealers.

Standard Knapp High Speed Can Labelers.

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PACKAGE MACHINERY

SPECIALS

Pneumatic Vacuflow 24 Head Rotary filler for Powders New-Still in crate
Ceco 40-9½ Carton Glue Sealing Machine, Automatic Carton Feeder—used one year
Clybourn Model B Cartoning Machines with Automatic Carton Feeder—used three years
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Consolidated 6 Spindle Cappers—Resina capper
Carter Vacuflow 16 Head Rotary Filler for Powders

Modern Jabez Burns Roasting-Blending-Cleaning-Grinding Equipment used about one year—including Two 23R Thermalo Smokeless Roasters with Automatic Roasting Controls still installed
Piecemeal or complete line for sale

Partial List

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SLICER, Urschel Model 0
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BEAN SNIPPERS, CRCO M del F & B
BEAN GRADERS, CRCO #4 & 5
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CORN HARVESTERS, FMC, latest improvements
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PEELERS, Pfaudler Steam & FMC Abrasive
PULPERS, FMC Model 50 & 100, stainless.
PEA VINERS, Scott & CRCO steel
APPLE FILLERS, Weber #10
APPLE SLICERS, Pease Seed Cell
APPLESAUCE COOKERS, Allan 3000#-8000#
JUICE FILLERS, Pfaudler C9 for #10 and 46-oz.
PEA & BEAN FILLERS, Ayars for 8-oz. and 303
ROD SHAKER, Tuc for corn
LABELER, Burt Late Model thru #10's
BOXER, Burt late Model for #10's
CLOSING MACHINE, Panama, any size can
PASTEURIZER, Creamery Package, juices, purees
SEPARATOR WASHER, Scott Vibro-Lux
TOMATO SCALDER, Haynie
CAPPER, Elgin Friction screw
COOKERS & COOLERS, FMC Atmospheric, any size

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Webster, New York Phone Webster 270 or 370

CIRCLE 723 ON READER SERVICE CARD

IMMEDIATE DELIVERY

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FILLERS—Stokes & Smith Mod. EG-1 S/S powder; Stokes & Smith Mod G-1, Holm weigh type, 6 lb. cap. powder filler (alum. const.); Food Machinery S/S 6 pocket rotary (No. 10 can).
TANKS—6500 gal. S/S lined, 3800 gal. S/S lined, 4500 gal. S/S lined, 1000 gal. closed top & botiom S/S 50 gal. S/S hoppers W/butterfly valves, 500 gal. S/S new.
SCREENS — Productive Equipment 3 deck screen, 2 deck S/S rotex model 41, 40" x 84".
MILLS—Fitz. Model D6 S/S Micro Mod. 2TH, Prater Mod. 009 125 HP Wtr., Jay Bee 75 HP mtr, Rietz disintegrator Mod. RD 18P.
KETTLES—75 gal. Lee S/S pressure cooker, Hamilton 150 gal. S/S 2/3 jktd for 100 psi, Groen 20 gal. S/S Model N, Groen 40 gal S/S Mod. N, 20 to 100 gal some new S/S clad kettles.
LABELERS—Burt Mod AU PA (No. 10 cans). New Jers. Mod 86ML 1 spot.
CASE SEALERS—Ferguson Mod D, fully auto.; A.B.C. Mod. A Mod. XSA, Mod. XSSA; Standard Knapp 10' long compression unit.
FILTERS—Sparkler Mod 33-9 S/S; Mod 33A66 Rubber lined; Mod 15-S-23.
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FOR SALE

Hayssen Model 5-9 Automatic Wrapper
Model MPUS-15 Miller Wrapper
Model MPUS-17 Miller Wrapper & Sheeter
20-gal. Stainless Steam Jacket Kettle with 1½" outlet for 100-lb. WSP.
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100-gal. Read Jacketed Double Armed Dough Mixer.

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"OUTSTANDING VALUES"

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4—Canco #10 Seamers, 2-08 and 2-05 Complete
1—A T & M 42" S.S. perf. basket Centrifuge. Plow & bot dump 25 Hp
3—Buflovak 42" x 90" Double Dryers. Comp/Conveyors & Elev.
2—Harris S.S. Vacuum Pans, 1-6' dia. and 1-7' dia. Complete
5—Fitzpatrick Comminuting Machines D-6, K-8 & Homoloid
9—New Westbilt Tanks, 250, 350, 500, 750, and 1000 Gal. in stock
2—Pfaudler R. P-14 S.S. Piston Fillers. Set for 202 dia can
2—FMC Round Shell 202 x 306 Cookers & Coolers, 700 cans

For immediate quote, wire or phone collect—GA 1-1380

ME

MACHINERY AND EQUIPMENT COMPANY

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INGREDIENTS FOR THE FOOD PROCESSOR

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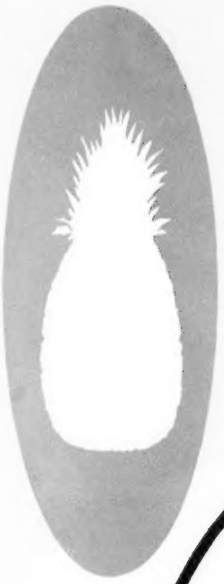

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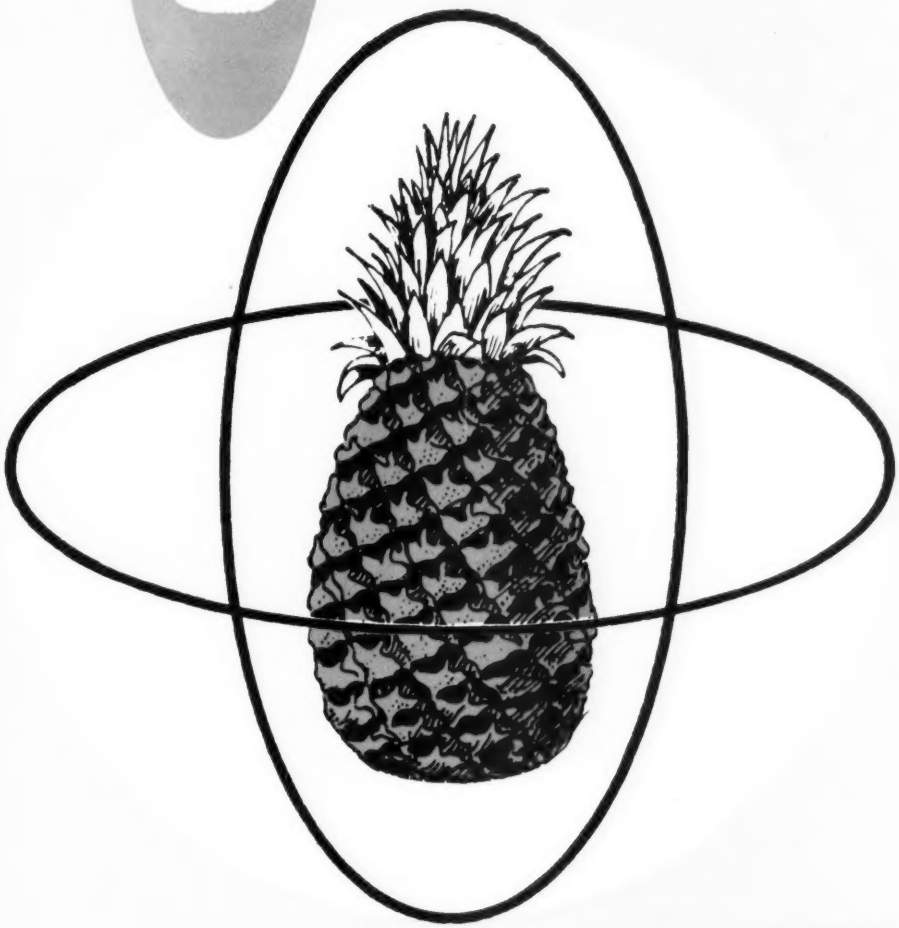

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